

CITY OF NEWTON
PURCHASING DEPARTMENT

CONTRACT FOR PUBLIC WORKS DEPARTMENT
(M.G.L. Ch. 30, Sec. 39m)

PROJECT MANUAL:
AREA B SEWER REHABILITATION – PHASE 1
WRA-P6-24-3-657
INVITATION FOR BID 10-26

Plans & Specifications
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NOVEMBER 2009
David B. Cohen, Mayor

CITY OF NEWTON, MASSACHUSETTS

PURCHASING DEPARTMENT

purchasing@newtonma.gov

Fax (617) 796-1227

November 23, 2009

ADDENDUM #1

INVITATION FOR BID #10-26

AREA B SEWER REHABILITATION – PHASE 1

THIS ADDENDUM IS TO: **Answer the following Questions from the Pre-Bid Meeting:**

Q1. Is there a field office required?

A1. NO

Q2. Where can we stage out equipment?

A2. Contractor's response, City has no available space.

Q3. Are we charged for the meter?

A3. NO

Q4. What is the meter charge?

A4. Deposit of \$400 that is refundable.

Q5. Is this work concentrated in one /two sections or is it spread over the City?

A5. Spread Out.

All other terms and conditions of this bid remain unchanged

PLEASE ENSURE THAT YOU ACKNOWLEDGE THIS ADDENDUM ON YOUR BID FORM

Thank you.
Re Cappoli
Chief Procurement Officer

CITY OF NEWTON

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END OF SECTION

**CITY OF NEWTON
PURCHASING DEPARTMENT
INVITATION FOR BID 10-26**

The City of Newton invites sealed bids from Contractors for :

AREA B SEWER REHABILITATION – PHASE 1

Pre-bid Conference: 10:00 a.m., November 19, 2009, City Hall, Rm #204

Bids will be received until: 10:00 a.m., December 1, 2009

at the Purchasing Department, Room 204, Newton City Hall, 1000 Commonwealth Ave., Newton, MA 02459. Immediately following the deadline for bids all bids received within the time specified will be publicly opened and read aloud.

The approximate scope of work of the **Base Bid** includes but is not necessarily limited to: Cleaning and inspection of 17,526 lf of sewers, open cut repair of 85 lf of sewer, cementitious lining of 3,918 vf of manholes, installation of 47 lf of cured-in-place short liners, 29,794 lf of cured-in-place pipe and reinstatement of 426 service connections, and 94 access port repairs.

The approximate scope of work of **Alternate Bid No.1** includes but is not necessarily limited to: Cementitious lining of 622 vf of manholes and 29 access port repairs.

The approximate scope of work of **Alternate Bid No.2** includes but is not necessarily limited to: Installation of 5,703 lf of cured-in-place pipe and reinstatement of 90 service connections.

Contract Documents will be available on line at www.ci.newton.ma.us/bids or for pickup at the Purchasing Department after **10:00 a.m., November 12, 2009**. There will be no charge for contract documents. **Award will be made to the bidder with the lowest total cost deemed responsible and eligible including any accepted alternates.**

All bids must be accompanied by a bid deposit in an amount that is not less than five percent (5%) of the value of the bid, including all add alternates. **All Bids must be submitted with one Original and one Copy.**

All bids are subject to the provisions of M.G.L. Chapter 30, Section 39M. **Wages are subject** to minimum wage rates determined by the Massachusetts Department of Labor and Industries pursuant to M.G.L. Chapter 149, Sec. 26 to 27H. The schedule of wage rates applicable to this contract is included in the bidding documents. In addition, the prevailing wage schedule will be updated annually for all public construction projects lasting longer than one (1) year. You will be required to pay the rates set out in any updated prevailing wage schedule. Increases in prevailing wage schedules will not be the basis for change order requests. The successful bidder will be required to provide a Certificate of Insurance demonstrating current coverage of the type and amounts set forth in the Project Manual. The successful bidder will be required to furnish both a **Labor and Materials Payment Bond and a Performance Bond in the amount of 100%** of the contract total.

The work within this contract must be brought to final substantial completion, exclusive of final paving and re-test inspection, within 230 calendar days, or if selected the Base Bid and Alternate 1 within 260 calendar days, or if selected the Base Bid and Alternate 1 and Alternate 2 within 260 calendar days of the start date fixed in the "Notice to Proceed." The contractor shall complete re-test inspection, for any work completed in the Base Bid, Alternate 1, and Alternate 2, within 56 calendar days of commencement of re-test inspection. Liquidated damages, as designated in Article 7, shall apply to the Contract and the retest period. Time is of the essence in the performance of the work of this contract. Bidders attention is directed to the provisions in the Project Manual regarding the assessment of liquidated damages for failure to complete the work within the time specified. Bidders attention is directed to the requirements of the City of Newton Supplemental Equal Employment Opportunity, Anti-Discrimination and Affirmative Action Program and also to the Minority/Women Business Enterprise Plan, December 1999, which is hereby incorporated into the Contract Documents.

All contractors are hereby notified of the TRENCH PERMIT pursuant to G.L. c.82A, section1 and 520 CMR 7.00 et seq (as amended). Please refer to Item 1 - Mobilization and ATTACHMENT - A TRENCH PERMIT.

The City of Newton will reject any and all bids when required to do so by the above referenced General Laws. In addition, the City of Newton reserves the right to waive any informalities in any or all bids, or to reject any or all bids in whole or in part, if it be in the public interest to do so.

CITY OF NEWTON
Re Cappoli
Chief Procurement Officer
November 12, 2009

CITY OF NEWTON
DEPARTMENT OF PURCHASING
INSTRUCTIONS TO BIDDERS

ARTICLE 1 - BIDDER'S REPRESENTATION

- 1.1 Each General Bidder (hereinafter called the "Bidder") by making a bid (hereinafter called "bid") represents that:
1. The Bidder has read and understands the Contract Documents and the bid is made in accordance therewith.
 2. The Bidder has visited the site and is familiar with the local conditions under which the Work has to be performed.
- 1.2 Failure to so examine the Contract Documents and site will not relieve any Bidder from any obligation under the bid as submitted.

ARTICLE 2 - REQUEST FOR INTERPRETATION

- 2.1 Bidders shall promptly notify the City of any ambiguity, inconsistency, or error which they may discover upon examination of the Contract Documents, the site, and local conditions.
- 2.2 Bidders requiring clarification or interpretation of the Contract Documents shall make a written request to the *Chief Procurement Officer*, at purchasing@newtonma.gov or via facsimile (617) 796-1227. The City will answer such requests if received seven (7) calendar days before the date for receipt of the bids.
- 2.3 Interpretation, correction, or change in the Contract Documents will be made by Addendum which will become part of the Contract Documents. The City will not be held accountable for any oral instruction.
- 2.4 Addenda will be faxed or mailed First Class postage by the USPS, to every individual or firm on record as having taken a set of Contract Documents.
- 2.5 Copies of addenda will be made available for inspection at the location listed in the Invitation for Bids where Contract Documents are on file, in addition to being available online at www.ci.newton.ma.us/bids.
- 2.6 Bidders downloading information off the internet web site are solely responsible for obtaining any addenda prior to the bid opening. If the bidder makes themselves known to the Purchasing Dept., at purchasing@newtonma.gov or via facsimile (617) 796-1227, they shall be placed on the bidder's list. Bidders must provide the Purchasing Dept. with their company's name, street address, city, state, zip, phone, fax and **INVITATION FOR BID NUMBER# 10-26**.

ARTICLE 3 – AA REQUIREMENTS

- 3.1 Bidders are advised that the City of Newton Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program is applicable to all construction contracts in excess of \$50,000.00. A copy of this program is incorporated in the Project Manual. A Contractor's Certification form must be signed by all successful low bidders prior as a condition of contract award. No contract shall be executed or valid unless the contractor has executed and submitted the Contractor's Certification. (see Attachment B to the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.)
- 3.2 The awarded bidder shall, prior to the award of any sub-contract, obtain from each of its sub-contractors the Sub-Contractors Certification certifying the Sub-Contractor shall comply with the minority manpower ratio and specific affirmative action steps described in the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program contained in the Project Manual. (see Attachment C to the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.)

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

- 4.1 Bids shall be submitted on the "Bid Form" as appropriate, furnished by the City.
- 4.2 All entries on the Bid Form shall be made by typewriter or in ink.
- 4.3 Any quantities indicated on the Bid Form or elsewhere in the Project Manual or Drawings are estimates only and are given solely as a basis for the comparison of bids. The City does not by implication or otherwise guarantee them to be even approximately correct. The Contractor shall have no claim for additional compensation, or refuse to do the work called for, by reason of the actual quantities involved being greater or lesser by any amount than those called for in the proposal.
- 4.4 Where so indicated on the Bid Form, sums shall be expressed in both words and figures. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control.
- 4.5 All proposals which contain abnormally high prices, or abnormally low prices, for any class of work, or those which contain unbalanced bidding in any form or manner may be rejected as informal.
- 4.6 Bid Deposits shall be submitted in the amount specified in the Invitation for Bids. They shall be made payable to the City of Newton and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid.
- Bid deposits of the three (3) lowest responsible and eligible Bidders shall be retained until the execution and delivery of the Owner/Contractor agreement.
- 4.7 The Bid, including the bid deposit shall be enclosed in a sealed envelope with the following plainly marked on the outside:
- GENERAL BID FOR:
 - NAME OF PROJECT AND **INVITATION NUMBER**
 - BIDDER'S NAME, BUSINESS ADDRESS, AND PHONE NUMBER
- 4.8 Be advised that a new Massachusetts law has been enacted that required all employees who work on Massachusetts public works construction sites must have no less than 10 hours of OSHA-approved safety and health training. See Chapter 306 of the Acts of 2004, which will become effective July 1, 2006.
1. This requirement will apply to any general bid or sub bid submitted on or after July 1, 2006 and to any contract awarded on or after July 1, 2006.
 2. This law directs the Massachusetts Attorney General to restrain the award of construction contracts to any contractor who is in violation of this requirement and to restrain the performance of these contracts by non-complying contractors.
 3. The contractor and all subcontractors on this project will be required to provide certification of compliance with this requirement. Non-compliance with this new Massachusetts Law will disqualify you from bidding on public contracts.
- 4.9 Date and time for receipt of bids is set forth in the Invitation for Bids.
- 4.10 Timely delivery of a bid at the location designated shall be the full responsibility of the Bidder.

ARTICLE 5 - ALTERNATES

- 5.1 Each Bidder shall acknowledge Alternates (if any) in Section C on the Bid Form.
- 5.2 In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicated by writing "No Change", or "N/C" or "0" in the space provided for that Alternate.
- 5.3 Bidders shall enter on the Bid Form a single amount for each Alternate which shall consist of the amount for work performed by the Contractor.
- 5.4 The low Bidder will be determined on the basis of the sum of the base bid and the accepted alternates.

ARTICLE 6 - WITHDRAWAL OF BIDS

- 6.1 Any bid may be withdrawn prior to the time designated for receipt of bids on written or telegraphic request. Telegraphic withdrawal of bids must be confirmed over the Bidder's signature by written notice postmarked on or before the date and time set for receipt of bids.
- 6.2 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids.
- 6.3 No bids shall be withdrawn for sixty days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

ARTICLE 7 - CONTRACT AWARD

- 7.1 The City of Newton will award the contract to the lowest eligible and responsible Bidder within sixty days, Saturdays, Sundays, and legal holidays excluded after the opening of bids.
- 7.2 The City of Newton reserves the right to waive any informalities in or to reject any or all Bids if it be in the public interest to do so.
- 7.3 As used herein, the term "lowest responsible and eligible Bidder" shall mean the Bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who, where the provisions of section eight B of chapter twenty-nine apply, shall have been determined to be qualified thereunder.
- 7.4 It is the purpose of the City not to award this contract to any bidder who does not furnish evidence satisfactory to the Chief Procurement Officer that he has the ability and experience in this class of work and that he has sufficient capital and plant to enable him to prosecute the same successfully and to complete it within the specified time and that he will complete it in accordance with the terms thereof.
- 7.5 Subsequent to the award and within five (5) days, Saturday, Sundays and legal holidays excluded, after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the City a Contract in the form included in the Contract Documents in such number of counterparts as the City may require.
- 7.6 In the event that the City receives low bids in identical amount from two or more responsive and responsible Bidders, the City shall select the successful Bidder by a blind selection process such as flipping a coin or drawing names from a hat. The low Bidders who are under consideration will be invited to attend and observe the selection process.

ARTICLE 8 - TAXES

- 8.1 The Bidder shall not include in this bid any tax imposed upon the sale or rental of tangible personal property in this Commonwealth, such as any and all building materials, supplies, services and equipment required to complete the work.
- 8.2 The City is exempt from payment of the Massachusetts Sales Tax, and the Bidder shall not include any sales tax on its bid. The City's exemption Number is E-046-001-404.

ARTICLE 9 – MWRA REQUIRED CONTRACT PROVISIONS

This Project is funded by the MWRA through its Local Financial Assistance Program. The MWRA requires that the following contract provisions be included in the contract for this Project.

9.1 Goals for Construction

Minority-owned Business Enterprise (MBE), women-owned Business Enterprise (WBE) and Equal Employment Opportunity policies of the Massachusetts Water Resources Authority (MWRA) and the City of Newton are applicable to this Contract. The Bidder shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction. The Bidder shall make positive efforts to achieve: (1) a minority employee work force hour goal of 10.00 percent, (2) a woman employee work force hour goal of 6.90 percent (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within project contracts. All MBEs and WBEs shall be certified by the Commonwealth of Massachusetts under the provisions certified by the State

Office of Minority and Women Business Assistance (SOMWBA). At a minimum, the community should allow MBEs and WBEs the maximum feasible opportunity to compete for subagreements performed under the project.

9.2 Project Inspection.

The Contractor shall make the project site and all project records available to MWRA staff for review during the course of the project. MWRA staff will periodically monitor the progress of work to insure that the project is: (1) proceeding substantially as defined in the Scope of Work/Project Schedule sections of the executed Financial Assistance Agreement; and (2) proceeding in a manner which will produce the quantitative I/I reduction result which the community estimated would be achieved in the executed Financial Assistance Application.

9.3 Project Audit Provisions.

The community, the community's engineer(s), and the community's contractor(s) shall maintain books, records, documents, and other evidence directly related to the performance on all work receiving funding under the executed Financial Assistance Agreement in accordance with generally accepted professional practice and appropriate accounting procedures and practices. The community, the community's engineer(s), and the community's contractor(s) shall also maintain the financial information and data used by the engineer(s) and contractor(s) in the preparation or support of project invoices and associated progress reports.

The MWRA and any other duly authorized person shall have access to such books, records, documents, and other evidence for inspection, audit, and copying. The community, the community's engineer(s), and the community's contractor(s) shall provide proper facilities for such access and inspection. All documents shall be kept for at least seven (7) years after the final payment to the engineer(s) or contractor(s), or at least seven (7) years after closeout of the project, whichever is later.

The community shall agree to include the wording of the above paragraph in all contracts and subcontracts with third party contractors, vendors and service providers related to this.

Audits conducted by the MWRA, or its duly authorized representatives, shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the MWRA.

END OF SECTION

CITY OF NEWTON
DEPARTMENT OF PURCHASING
BID FORM# 10-26

- A. The undersigned proposes to furnish all labor and materials required in accordance with the Contract Documents supplied by the City of Newton entitled:

Area B Sewer Rehabilitation – Phase 1

for the contract price specified below, subject to additions and deduction according to the terms of the specifications.

- B. This bid includes addenda number(s) _____, _____, _____, _____,

- C. The proposed contract price for **Base Bid (Items 1 to 14)** is:

_____ DOLLARS (\$ _____).
(The figure inserted above shall be the TotalPrice as computed on the Item Sheets attached hereto.)

The proposed contract price for **Alternate No. 1 (Items 15 to 18)** is:

_____ DOLLARS (\$ _____).
(The figure inserted above shall be the TotalPrice as computed on the Item Sheets attached hereto.)

The proposed contract price for **Alternate No. 2 (Items 19 to 23)** is:

_____ DOLLARS (\$ _____).
(The figure inserted above shall be the TotalPrice as computed on the Item Sheets attached hereto.)

COMPANY: _____

- D. The undersigned has completed and submits herewith the following documents:

- ☐ Bid Item Sheets, 12 pages
- ☐ Bid Form, 2 pages
- ☐ Bidder's Qualification Form and References;
- ☐ A five percent (5%) bid deposit/bid guarantee.

- E.** The undersigned agrees that, if s/he is selected as general contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that s/he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A of M.G.L. Chapter 30, s 39M.

The undersigned certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration ("OSHA") that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States OSHA that is at least 10 hours in duration. The undersigned understands that any employee found on a worksite subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date _____

(Name of General Bidder)

BY: _____

(Printed Name and Title of Signatory)

(Business Address)

(City, State Zip)

(Telephone)

/_____
(FAX)

(E-mail Address)

NOTE: If the bidder is a corporation, indicate state of incorporation under signature, and affix corporate seal; if a partnership, give full names and residential addresses of all partners; if an individual, give residential address if different from business address; and, if operating as a d/b/a give full legal identity. Attach additional pages as necessary.

END OF SECTION

The Contractor shall insert prices for each item in ink, in both words and figures, and is to show a total bid price. In the event a discrepancy between the written words and figures, the written words shall govern. In the event an error in the bidders total bid price, the corrected total bid obtained by the summation of the products of the unit prices multiplied by the respective quantities shall stand as the bidder's total bid price.

The Contractor is required to review any related plans, conduct a full site review, and read all the provisions in the document before inserting prices, and is further advised to make his own determination as to the accuracy of the estimated quantities before inserting bid prices.

The estimated quantities shown here are based solely upon a reasonable assessment of the project parameters, thus the Contractor is advised that the actual quantities may vary substantially as field conditions may necessitate.

THIS SPACE INTENTIONALLY LEFT BLANK

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
BASE BID (SHEETS C-3 to C-12)			
1		Cleaning and Inspection of Sewers:	
1a	17,526	Cleaning and inspection of sewers, 6" to 12", per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
2		Point Repair of Gravity Sewer:	
2a	9	Chestnut Street, B022-30 to B022-29, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
2b	17	Lenox Street, B022-103 to B022-87, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
2c	10	Claremont Street, B066-32 to B066-100, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
2d	40	Centre Street, B066-34 to B066-26, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
2e	9	Converse Street, B066-41 to B066-40, per linear foot	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
3		Replace 6" Sewer Service:	
3a	2	Replace 6" sewer service, per service	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
4		Sewer Line and Manhole Chemical Root Treatment:	
4a	15,732	Chemical root treatment of 8" sewers, per linear foot	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
4b	18	Chemical root treatment of manholes, per manhole	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
5		Cured-in-Place Short Liner:	
5a	19	Cured-in-place short liner for 8" sewers, per linear foot	\$
		(dollars)	
		and	
		(cents)	
		(\$)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
6		Cured-in-Place Structural Short Liner:	
6a	28	Cured-in-place structural short liner for 8" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
7		Cured-in-Place Pipe:	
7a	27,681	Cured-in-place pipe for 8" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
7b	727	Cured-in-place pipe for 10" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
7c	426	Reinstate service connections in cured-in-place pipe, per service connection	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
8		Cured-in-Place Structural Pipe:	
8a	1,386	Structural cured-in-place pipe for 8" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
9		Service Connection Rehabilitation:	
9a	6	Cutting of protruding service connections, per service connection	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
9b	5	Inspect and test service connections, per service connection	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
9c	5	Grout service connections, per service connection	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
10		Sewer Manhole Rehabilitation:	
10a	3,918	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
10b	13	Furnish and install manhole frames and covers, per frame and cover	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
10c	2	Build manhole bench and invert, per bench and invert	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
10d	1	Manhole rehabilitation of B040-6, lump sum	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
10e	1	Install Sewer Manhole Complete, lump sum	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
11		Sealing of Underdrain Access Ports:	
11a	8	Seal cavern and redirect access port, per location	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
11b	54	Redirect access port, per access port	\$
		(dollars)	
		and	
		(cents)	
		(\$)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
11c	32	Seal access port, per access port	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
11d	1	Seal cross connection, per cross connection	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
12		Flow Isolation:	
12a	10	Spot flow isolation, as directed by engineer, per each	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
12b	28,834	Post flow isolation, per linear foot	\$
		(dollars)	
		and	
		(cents)	
		(\$)	
13		Uniformed Officers for Traffic Control:	
13a	3,114	Uniformed officers for traffic control, per hour	\$137,016.00
		Forty Four Dollars	
		(dollars)	
		and Zero Cents	
		(cents)	
		(\$44.00)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
14		Mobilization:	
14a	1	Mobilization, lump sum (not more than 5% of total of Items 1 to 12)	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

TOTAL AMOUNT OF BASE BID (1 to 14)

\$ _____ (In Words) (\$ _____) (In Figures)

The Total for Items 1 to 14 (Base Bid) must be inserted in Paragraph “C” of the BID FORM.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
ALTERNATE BID NO. 1 (SHEETS C-13 to C-15)			
15		Sewer Manhole Rehabilitation	
15a	622	Cementitious lining of manholes, per vertical foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
16		Sealing of Underdrain Access Ports	
16a	18	Redirect access port, per access port	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
16b	11	Seal access port, per access port	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
17		Uniformed Officers for Traffic Control:	
17a	396	Uniformed officers for traffic control, per hour	\$17,424 _____
		Forty Four Dollars	
		_____ (dollars)	
		and Zero Cents	
		_____ (cents)	
		(\$44.00 _____)	

*Quantity assumed for comparison of bids.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
18		Mobilization:	
18a	1	Mobilization, lump sum (not more than 5% of total of Items 15 to 16)	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	

*Quantity assumed for comparison of bids.

TOTAL AMOUNT OF ALTERNATE BID NO. 1 (15 to 18)

\$ _____ (\$ _____)
(In Words) (In Figures)

The Total for Items 15 to 18 (Alternate Bid No. 1) must be inserted in Paragraph "C" of the BID FORM.

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
ALTERNATE BID NO. 2 (SHEET C-15)			
19		Cured-in-Place Pipe:	
19a	4,320	Cured-in-place pipe for 8" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
19b	90	Reinstate service connections in cured-in-place pipe, per service connection	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
20		Cured-in-Place Structural Pipe:	
20a	1,383	Cured-in-place structural pipe for 8" sewers, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
21		Flow Isolation:	
21a	5,703	Post flow isolation, per linear foot	\$ _____
		_____ (dollars)	
		and _____	
		_____ (cents)	
		(\$ _____)	
22		Uniformed Officers for Traffic Control:	
22a	108	Uniformed officers for traffic control, per hour	\$4,752
		Forty Four Dollars	
		_____ (dollars)	
		and Zero Cents	
		_____ (cents)	
		(\$44.00 _____)	

Item No.	Estimated Quantity*	Brief Description Unit or Lump Sum Price Bid in Both Words and Figures	Total in Figures
23		Mobilization	
23a	1	Mobilization, lump sum (not more than 5% of total of Items 19 to 21)	\$
		(dollars)	
		and	
		(cents)	
		(\$)	

*Quantity assumed for comparison of bids.

TOTAL AMOUNT OF ALTERNATE BID NO. 2 (19 to 23)

\$ (In Words) (\$ (In Figures))

The Total for Items 19 to 23 (Alternate Bid No. 2) must be inserted in Paragraph "C" of the BID FORM.

END OF SECTION

CITY OF NEWTON

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

All questions must be answered, and the data given must be clear and comprehensive. Please type or print legibly. If necessary, add additional sheet for starred items. This information will be utilized by the City of Newton for purposes of determining bidder responsiveness and responsibility with regard to the requirements and specifications of the Contract.

1. FIRM NAME: _____
2. WHEN ORGANIZED: _____
3. INCORPORATED? ☒ YES ☐ NO DATE AND STATE OF INCORPORATION: _____
- * 4. LIST ALL CONTRACTS CURRENTLY ON HAND, SHOWING CONTRACT AMOUNT AND ANTICIPATED DATE OF COMPLETION:

- * 5. HAVE YOU EVER FAILED TO COMPLETE A CONTRACT AWARDED TO YOU?
☐ YES ☐ NO
IF YES, WHERE AND WHY?

- * 6. HAVE YOU EVER DEFAULTED ON A CONTRACT? ☐ YES ☐ NO
IF YES, PROVIDE DETAILS.

- * 7. LIST YOUR VEHICLES/EQUIPMENT AVAILABLE FOR THIS CONTRACT:

- * 8. IN THE SPACES FOLLOWING, PROVIDE INFORMATION REGARDING CONTRACTS COMPLETED BY YOUR FIRM SIMILAR IN NATURE TO THE PROJECT BEING BID. A MINIMUM OF FOUR (4) CONTRACTS SHALL BE LISTED. PUBLICLY BID CONTRACTS ARE PREFERRED, BUT NOT MANDATORY.

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: \$ _____ DATE COMPLETED: _____

PUBLICLY BID? ☐ YES ☐ NO

TYPE OF WORK?: _____

CONTACT PERSON: _____ TELEPHONE #: (____) _____

CONTACT PERSON'S RELATION TO PROJECT?: _____

(i.e., contract manager, purchasing agent, etc.)

PROJECT NAME: _____

OWNER: _____

CITY/STATE: _____

DOLLAR AMOUNT: \$ _____ DATE COMPLETED: _____

PUBLICLY BID? ☐ YES ☐ NO

TYPE OF WORK?: _____

CONTACT PERSON: _____ TELEPHONE #: (____) _____

CONTACT PERSON'S RELATION TO PROJECT?: _____

(i.e., contract manager, purchasing agent, etc.)

PROJECT NAME: _____

OWNER: _____

CITY/STATE: _____

DOLLAR AMOUNT: \$ _____ DATE COMPLETED: _____

PUBLICLY BID? ☐ YES ☐ NO

TYPE OF WORK?: _____

CONTACT PERSON: _____ TELEPHONE #: (____) _____

CONTACT PERSON'S RELATION TO PROJECT?: _____

(i.e., contract manager, purchasing agent, etc.)

PROJECT NAME: _____

OWNER: _____

CITY/STATE: _____

DOLLAR AMOUNT: \$ _____ DATE COMPLETED: _____

PUBLICLY BID? ☐ YES ☐ NO

TYPE OF WORK?: _____

CONTACT PERSON: _____ TELEPHONE #: (____) _____

CONTACT PERSON'S RELATION TO PROJECT?: _____

(i.e., contract manager, purchasing agent, etc.)

9. The undersigned certifies that the information contained herein is complete and accurate and hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the City of Newton in verification of the recitals comprising this statement of Bidder's qualifications and experience.

DATE: _____ BIDDER: _____

SIGNATURE: _____

PRINTED NAME: _____ TITLE: _____

END OF SECTION

CONTRACT FORMS

The awarded bidder will be required to complete and submit the following documents in order to execute a contract pursuant to this bid.

The forms are provided for informational purposes only.

None of the following forms are required at the time of bid submittal.

CITY-CONTRACTOR AGREEMENT

CONTRACT NO. C-

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand and Nine by and between the CITY OF NEWTON, a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, hereinafter referred to as the CITY, acting through its Chief Procurement Officer, but without personal liability to him, and hereinafter referred to as the CONTRACTOR.

The parties hereto for the consideration hereinafter set forth agree as follows:

ARTICLE 1. STATEMENT OF WORK. The Contractor shall furnish all labor, materials, and equipment and perform all work required in strict accordance with the Contract Documents for the following project:

AREA B SEWER REHABILITATION – PHASE 1

ARTICLE 2. TIME OF COMPLETION. The Contractor shall commence work under this Contract on the date specified in the written notice of the City to proceed and shall fully complete all work hereunder within the time specified (**230 calendar days**) or if selected the Base Bid and Alternate 1 within 260 calendar days, or if selected the Base Bid and Alternate 1 and Alternate 2 within 260 calendar days in the Summary of Work and Specific Work Requirements of the Project Manual. Time is of the essence with regard to this contract. Failure to complete within the time specified shall be subject to the assessment of liquidated damages in accordance with the provisions contained in the Project Manual.

The work within this contract must be brought to final substantial completion, exclusive of final paving and re-test inspection, within 230 calendar days or if selected the Base Bid and Alternate 1 within 260 calendar days, or if selected the Base Bid and Alternate 1 and Alternate 2 within 260 calendar days of the start date fixed in the “Notice to Proceed.” The contractor shall complete re-test inspection, for any work completed in the Base Bid, Alternate 1, and Alternate 2, within 56 calendar days of commencement of re-test inspection. Liquidated damages, as designated in Article 7, shall apply to the Contract and the retest period. Time is of the essence in the performance of the work of this contract. Bidders attention is directed to the provisions in the Project Manual regarding the assessment of liquidated damages for failure to complete the work within the time specified.

ARTICLE 3. THE CONTRACT PRICE. The City shall pay the Contractor for the full and satisfactory performance of the Contract, in current funds a sum not to exceed:

(\$)

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of the following documents which are either attached to this Agreement or are incorporated herein by reference:

- a. This CITY-CONTRACTOR Agreement;
- b. The City's Invitation For Bid # 10-26 issued by the Purchasing Department;
- c. The Project Manual for the Area B Sewer Replacement – Phase 1, including the Instructions to Bidders; General Conditions; Special Conditions; MWBE/AA Requirements, Wage Rate Requirements and Wage Rate Schedule(s) including any updated prevailing wage rate schedules if applicable; The Supplementary Special Conditions; General Requirements and Project Specifications; and Drawings, if included or referenced therein;
- d. Addenda Number(s);

- e. The Bid Response of the CONTRACTOR submitted for this Project and accompanying documents and certifications;
- f. Certificate(s) of Insurance and surety bond(s) submitted by the CONTRACTOR in connection with this Project;
- g. Duly authorized and executed Amendments, Change Orders or Work Orders issued by the CITY after execution of this CITY-CONTRACTOR Agreement.

This CITY-CONTRACTOR Agreement, together with the other documents enumerated in this Article, constitute the entire Agreement between the CITY and the CONTRACTOR.

ARTICLE 5. ALTERNATES. The following Alternates have been accepted and their costs are included in the Contract Price stated in Article 3 of this Agreement:

Alternates: _____

ARTICLE 6. APPLICABLE STATUTES. All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed under seal the day and year first above written.

CONTRACTOR

CITY OF NEWTON

By _____
Title _____

By _____
Chief Procurement Officer

Date _____

Date _____

Affix Corporate Seal Here

By _____
Commissioner of Public Works

Date _____

Certified that additional funds are
in the following accounts:

Approved as to Legal Form and
Character

By _____
Associate City Solicitor

I further certify that the Mayor is
authorized to execute contracts and
approve change orders.

Date _____

By _____
Comptroller of Accounts

CONTRACT AND BONDS APPROVED

Date _____

By _____
David B. Cohen, Mayor

Date _____

CERTIFICATE OF AUTHORITY - CORPORATE

1. I hereby certify that I am the Clerk/Secretary of _____
(insert full name of Corporation)
2. corporation, and that _____
(insert the name of officer who signed the **contract and bonds.**)
3. is the duly elected _____
(insert the title of the officer in line 2)
4. of said corporation, and that on _____
(insert a date that is ***ON OR BEFORE*** the date the officer signed the **contract and bonds.**)

at a duly authorized meeting of the Board of Directors of said corporation, at which all the directors were present or waived notice, it was voted that

5. _____ the _____
(insert **name** from line 2) (insert **title** from line 3)

of this corporation be and hereby is authorized to execute contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

6. ATTEST: _____ *AFFIX CORPORATE*
(Signature of **Clerk or Secretary**)* *SEAL HERE*
7. Name: _____
(Please print or type name in line 6)*
8. Date: _____
(insert a date that is ***ON OR AFTER*** the date the officer signed the **contract and bonds.**)

* The name and signature inserted in lines 6 & 7 **must** be that of the **Clerk or Secretary** of the corporation.

ATTESTATION

Pursuant to MG c. 62C, § 49A, the undersigned acting on behalf of the Contractor, certifies under the penalties of perjury that, to the best of the undersign's knowledge and belief, the Contractor is in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.*

**Signature of Individual
or Corporate Contractor (Mandatory)

*** Contractor's Social Security Number
(Voluntary) or Federal Identification Number

By: _____
Corporate Officer
(Mandatory, if applicable)

Date: _____

* The provision in the Attestation relating to child support applies only when the Contractor is an individual.

** Approval of a contract or other agreement will not be granted unless the applicant signs this certification clause.

*** Your social security number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency will not have a contract or other agreement issued, renewed, or extended. This request is made under the authority of GL c. 62C, § 49A.

CITY OF NEWTON, MASSACHUSETTS

PERFORMANCE BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Newton as Obligee, in the sum of _____ dollars (\$_____) to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____, 2009, for the construction of _____ in Newton, Massachusetts.
(Project Title)

Now, the condition of this obligation is such that if the PRINCIPAL and all Sub-contractors under said contract shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said contract on its part to be kept and performed during the original term of said contract and any extensions thereof that may be granted by the Obligee, with or without notice to the SURETY, and during the life and any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise, it shall remain in full force, virtue and effect.

In the event, that the contract is abandoned by the PRINCIPAL, or in the event that the Obligee terminates the employment of the PRINCIPAL or the authority of the PRINCIPAL to continue the work said SURETY hereby further agrees that said SURETY shall, if requested in writing by the Obligee, take such action as is necessary to complete said contract.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ____day of _____ 2009.

PRINCIPAL

SURETY

BY _____

BY _____

(SEAL)

(ATTORNEY-IN-FACT) (SEAL)

(Title)

ATTEST: _____

ATTEST: _____

CITY OF NEWTON, MASSACHUSETTS

PAYMENT BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____, as SURETY, are held and firmly bound unto the City of Newton as Obligee, in the sum of _____ dollars (\$_____) to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____, 2009 for the construction of _____ in Newton, Massachusetts.
(Project Title)

Now, the conditions of this obligation are such that if the PRINCIPAL and all Sub-contractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c. 30, sec. 39A, and M.G.L. c. 149 sec. 29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force, virtue and effect.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ____day of____2009.

PRINCIPAL

SURETY

BY _____

BY _____

(SEAL)

(ATTORNEY-IN-FACT) (SEAL)

(Title)

ATTEST: _____

ATTEST: _____

CITY OF NEWTON
GENERAL CONDITIONS OF THE CONTRACT
FOR PUBLIC WORKS CONSTRUCTION

ARTICLE 1

Definitions

The word "Commissioner" shall mean the official duly authorized to act for the City of Newton in the execution of the work of this contract, acting directly or through properly authorized agents.

The word "Engineer," or "City Engineer," shall mean the City Engineer of the City of Newton, acting directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

The word "Contractor" shall mean the party or parties contracting to perform the work covered by this contract or his, or their, legal representatives, successors or assigns.

The word "Plan" shall mean plans referred to and included in the Project Manual for this contract. The word "City" shall mean the City of Newton.

The term "Substantial Completion" shall mean either that the work required by the contract has been completed except for the work having a contract price of less than one per cent of the then adjusted contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract.

ARTICLE 2

Plans, Drawings, Profiles

1. The work shall be done in accordance with plans referred to in Article 1 and such further working and detail plans, drawings and profiles as may be furnished from time to time by the Engineer. All said plans, general and detail, are to be deemed a part of this contract, and the said plans, specifications and contract are to be considered together, so that any work mentioned in the contract, though not shown on the plans, and any work shown on the plans though not mentioned in the contract, is to be executed by the Contractor as a part of this contract. Figured dimensions are to prevail over scale. All things which in the opinion of the Engineer may fairly be inferred from the contract, plans and specifications, are to be executed by the Contractor as a part of the contract; and the Engineer shall be sole judge as to whether detail plans, drawings and profiles conform to the general plans and the contract.

Discrepancy in Plans

2. The Contractor shall carefully examine all said plans, profiles, drawings, specifications and orders; all figures, dimensions, lines, marks and scales thereof, and all directions of the Commissioner and the Engineer relating to the work, and conform to those in relation to which there is no doubt or discrepancy, but at once submit all cases of doubt or discrepancy to the Engineer for adjustment. Anything done on any part of the work for which special information or drawing should be procured, unless done in accordance with such information or drawing, or anything done in relation to which there is doubt or discrepancy, except in accordance with the adjustment thereof, or done in violation of law or public authority, is to be redone if the Commissioner shall so direct.

ARTICLE 3

Inspection

1. The Contractor in carrying on the contract shall conform to all determinations and directions of the Engineer relating to the proper interpretation of the plans, specifications, profiles or drawings, the fitness of persons employed on the work or the number thereof, or the suitability, amount, quality, and value of anything done or any materials used, and the Contractor shall permit the Commissioner and the Engineer and persons designated by them to enter upon the work and inspect the same at all times and in all places, and shall provide safe and convenient facilities for making such entry and inspection.

ARTICLE 4

Change in Plans and Work

1. The City, acting through the Commissioner and upon his written order only, from time to time given to the Contractor or his foreman, may change, increase or take away any part of the work, or change the specifications, plans, drawings, form or materials thereof. Any deduction or addition thereto is to be allowed, or paid for at a price to be determined, within not more than 15 days of the completion of the change, by the City Engineer acting in the same capacity as an architect in a building contract as between owner and contractor. Any demand for addition or deduction must be made in writing to the City Engineer within seven (7) days of the time change was ordered.

ARTICLE 5

Time and Manner of Doing the Work

1. The Contractor shall begin work upon receipt of written Notice to Proceed. Once begun the work shall be carried out in a continuous and uninterrupted fashion with sufficient workforce and resources to assure completion by the date for completion established by the Contract Documents.

2. The Contractor shall carry on the work in accordance with the requirements of law and of all other public authorities, and to the satisfaction of the Commissioner; he shall give all notices, take out all permits, pay all charges and fees, give personal supervision to the work and keep thereon a competent foreman and sufficient employees, skilled in the several parts which are given them to do.

Maintenance of Travel

3. The Contractor shall conduct his work so as to interfere as little as possible with public travel, and shall give property owners proper means of access to their property where existing access has been cut off by the work. The Contractor shall keep the streets open for through travel except where, in the opinion of the Commissioner, it is necessary to close the street. The continuous length of the street occupied for the work shall be kept as short as possible, and no part of the work shall be unnecessarily delayed. Wherever the Commissioner shall direct, trenches shall be bridged by the Contractor in a proper and secure manner so as not to interrupt travel. Free access shall be maintained at all times to all water gates, gas gates, and fire hydrants.

Abandonment of Work by Contractor

4. In the event the City Engineer certifies to the Commissioner that the work is not being so carried forward or if the Contractor at any time is not carrying on the work to the satisfaction of the Commissioner, or is not observing any of the provisions of the contract, or has abandoned the work, or become insolvent or assigned his property, the City, acting by the Commissioner and at his discretion, may, with or without notice to the Contractor, or advertising for doing the work, and by contract, day labor or otherwise, do any part of the work which the Contractor has failed to do or replace any part not done to the satisfaction of the Commissioner, or take possession of the work and complete the same, and in doing so may use any implements, machinery or materials on or about the work which are the property of the Contractor, charging the Contractor any excess cost for completing the work, which excess cost the Contractor agrees to pay.

ARTICLE 6

Compensation for Work

1. Subject to the provisions of Paragraph 10 of this Article, the price named in the proposal and accepted by the City shall be paid by the City and received by the Contractor as full compensation for furnishing materials and for use of tools, forms, machinery and other implements, and for labor in moving materials and executing all the work contemplated in this contract, also for loss or damage arising from delay however occasioned, or out of the nature of the work aforesaid or from the action of the elements, from floods, or from any unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work and for well and faithfully completing the work in the proper manner and according to the plans and specifications and requirements of the Commissioner under them.

2. During the first week of each calendar month, the City Engineer shall cause all work done by the Contractor during the previous month to be measured and shall estimate the value thereof and, on or before the 10th of each month issue a certificate to the Commissioner of the measurements and the amount due the Contractor according to the terms of his contract.

3. The City shall pay the Contractor on approval of the Commissioner monthly on or before the 18th of each month for all work done during the preceding month according to the aforementioned certificate of the City Engineer, less 5 per cent of the amount of such work and less any amounts due the City by the Contractor.

Final and Substantial Completion

4. Upon substantial completion of the work required by the Contract, the Contractor must present to the City Engineer written certification that the work is substantially complete. Within 21 calendar days after such certification is presented the City Engineer shall present to the Contractor either a written declaration that the work is substantially complete or an itemized list of incomplete or unsatisfactory work items sufficient to demonstrate that the work is not substantially complete. The City Engineer shall include with such itemized list a date by which the work items must be completed, which date may not be earlier than the date for substantial completion established in the Contract Documents. If the City Engineer does not respond as provided herein within 21 calendar days, then the date of the Contractor's certification shall become the date for effective declaration of substantial completion.

5. Within 15 calendar days after the effective declaration of substantial completion, the City Engineer shall send to the Contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items. Unless delayed by causes beyond the Contractor's control, with an extension of time granted pursuant to Article 8, the Contractor must complete the work items within 45 calendar days after receipt of the list, or by the contractual completion date, whichever is later. If the contractor fails to complete the work within the required time the City may, notwithstanding other rights and remedies at its disposal, and upon seven days written notice to the Contractor terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the Contractor.

6. Within 65 calendar days following the effective declaration of substantial completion, the City Engineer shall issue to the Commissioner who shall cause to be paid to the Contractor a substantial completion estimate which estimate shall consist of the balance of the then current contract price less a one percent retention, the estimated cost to complete incomplete or unsatisfactory work items, the value of any outstanding claims against the Contractor and the sum of all demands for direct payment made pursuant to Article 12 herein, provided that until final acceptance, the City shall retain five percent of the value of all items planted in the ground.

7. The Contractor shall provide written notice to the City Engineer when the work has been brought to final completion. Within ten days following receipt of such notice, and providing his inspection shows no work items remain incomplete or unsatisfactory, the City Engineer shall issue to the Commissioner a final certificate of the total amount of work done and the money due the Contractor therefor, crediting thereon the amounts of the previous payments. In making the final certificate, the City Engineer shall not be bound by any preceding certificate or estimate of the amount of work done or materials furnished.

8. Within 30 calendar days following receipt of final completion, the City shall pay the Contractor, on the approval of the Commissioner, the percentages retained and the balance due the Contractor according to the aforementioned final certificate of the City Engineer less any indebtedness of the Contractor for incomplete or unsatisfactory work or claims made by or against the City. If a claim or claims are made, or notice of liability given, such amounts due the Contractor may be paid upon satisfaction of such claims or upon furnishing of indemnity to said City against all loss, cost, damage or expense by reason of such claims.

9. The City, on making any payment after the completion of the work, shall be released from all claim or liability to the Contractor for anything done or used, or for any loss or injury sustained in carrying on the contract, or for any act, omission, neglect or mistake of the City or any person relating to or affecting the contract, except for the balance of any sum retained as aforesaid.

Extra Work

10. The Contractor shall be paid for any additions, or deductions as provided in Article 4, paragraph 1, and for extra labor done by, and for extra materials furnished by him in compliance with the written order only of the Commissioner, calling for work not similar in character to that covered by the items given in the proposal, and for which no price is set in the said written order, the direct (not including consequential) cost to the Contractor, as determined to be reasonable by the Commissioner, plus fifteen per cent of said costs as so determined in regard to labor only. For teams or trucks so furnished, no payment shall be made to the Contractor beyond the current local rate as determined by the Commissioner in each case. The direct cost of labor may include the cost of mechanics and laborers furnished and a reasonable proportion of the time of the foreman and timekeeper, but it shall in no case include any charge for the use of tools, for establishment charges or for time spent by the Contractor. The actual cost of insurance on extra pay rolls and of materials furnished for extra work, shall be paid without any addition. The labor and materials so ordered shall constitute a part of the work to be done under the contract; and all and singular the provisions of the contract shall apply to said labor and materials as if the same were specified therein. The Contractor shall have no claim for the above mentioned extra labor and materials unless he furnishes the details and bills therefor within one week after doing any such labor or furnishing any such materials.

11. No claim of the Contractor against the City under this contract shall be deemed valid unless such claim is presented to the Commissioner within ten days from the time when the Contractor first knows of, or has opportunity to know of, the acts and circumstances on which such claim is based.

12. A payment or payments to the Contractor, in cases where these provisions or any of them, are not complied with, shall not be construed as a waiver of said provisions or any part thereof.

Contract Made Subject to Appropriations

13. This contract is made subject to appropriation heretofore made and shall not be altered unless the Contractor, the sureties on the bond, if any, the officer making the contract and the Mayor shall in writing agree thereto.

ARTICLE 7

Liquidated Damages

1. In case the work embraced in the contract shall not have been substantially completed by the date stipulated therein, the Contractor shall pay to the City of Newton as liquidated damages a designated sum per calendar day for the entire period of overrun until the work is substantially completed in accordance with the following Schedule of Deductions, and in addition, the Contractor shall pay without reimbursement the entire cost of all traffic officers, railroad flagmen, inspectors, or other personnel the City Engineer and/or the Chief Engineer of the railroad determines to be necessary during the period of overrun of time.

\$1,200.00 for each consecutive calendar day

2. Whatever sum of money may become due and payable to the City of Newton by the Contractor under this Article may be retained out of money belonging to the Contractor in the hands and possession of the City of Newton. It is agreed that this Article shall be construed and treated by the parties to the contract not as imposing a penalty upon said Contractor for failing fully to complete said work as agreed on or before the time specified in the proposal, but as liquidated damages to compensate said City of Newton for all additional costs incurred by it because of the failure of the Contractor fully to complete said work on or before the date of completion specified in the proposal.

ARTICLE 8

Delays and Extensions of Time

1. If the Contractor is delayed at any time in the progress of the work by an act or neglect of the City, or by changes in the work ordered by the City, or by unseasonably inclement weather, or by other causes deemed by the City Engineer to be beyond the Contractor's control, and which the City Engineer determines may justify delay, then the time for completion may be extended for such reasonable time as the City Engineer may determine.

2. No such extension of time will be allowed unless the Contractor submits a written request for an extension to the City Engineer no later than 10 calendar days of the start of the occurrence or event giving rise thereto. Each such request must describe the occurrence or event and specify the manner and extent that such occurrence or event is causing or has caused a delay in the work. The City Engineer shall promptly investigate each request and make his written determination to the Commissioner and the Contractor within 10 days after receipt of the request. In his determination the City Engineer may either grant, deny, or modify the length of the requested extension.

3. If the City Engineer's determination so warrants, the Commissioner shall authorize a written Change Order to the Contract extending the time for completion. No extension of time shall be deemed as granted until said Change Order has been duly executed by the parties.

4. Change Orders which may be executed by the City and the Contractor in connection with additions, extra labor and/or extra materials shall not be considered as allowing extensions of the time for completion unless the change order expressly specifies that additional time is allowed in connection with the work under the change order. Once a Change Order has been executed by the parties, any request by the Contractor for an extension of time based solely on the fact that additions, extra labor and/or extra materials are required by the Change Order will be denied by the City Engineer.

5. Permitting the Contractor to continue and finish the work or any part of it after the times fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the City of Newton of any of its rights under the contract. The Contractor remains liable for damages caused other than by delay.

ARTICLE 9

Lines and Grades

1. The Contractor shall retain a Registered Land Surveyor who shall furnish such boards and stakes and cause to be placed thereon, such lines, marks and directions relating to the work as the Commissioner or City Engineer shall from time to time direct.

ARTICLE 10

Public Service Pipes and Conduits

1. The Contractor shall maintain such pipes or conduits of public service corporations or of the City as are across or within the lines of the work until such time as said public service corporations or the City assume the maintenance or removal of said pipes or conduits. The Commissioner will notify such public service corporations to that effect on the existence of such obstructions to the work being brought to his notice by the Contractor. The City will relocate either temporarily or permanently all water mains and water service pipes, or hydrants, and drains or sewers which may interfere with the work contemplated in this contract. (This clause is not to be construed as applying to such pipes as may be readily supported and protected during the progress of the work.) The cost of shutting off and turning on water in water mains during blasting shall be assumed by the City.

Protection of Existing Structures

2. All existing gas pipes, water pipes, sewers, drains, conduits, or other structures which are uncovered by the excavation shall be carefully supported and protected from injury by the Contractor, and, in case of injury, they shall be restored by him, without compensation therefor, to as good condition as that in which they were found, and shall be kept in repair until 6 months after the completion of the work. The Contractor shall provide suitable temporary channels for water

at all water courses. Wherever the work passes under or adjacent to street railway tracks, the Contractor shall make all necessary arrangements with the railway company for doing any work which may affect the property of the company or interfere with the operating of the railway, and he shall be liable for any damage that may be caused by any act, omission or neglect on his part, and shall pay all expenses of every kind incidental to this work.

Changing the Location of Existing Structures

3. Whenever it becomes necessary to change the location of any water or gas pipes, sewers, drains, conduits or other structures not otherwise provided for in these specifications, the Contractor shall do the whole or such portions of the work of making such changes as the Commissioner may require, and shall receive in payment therefor the reasonable cost of the work done as determined by the Commissioner plus 15 per cent of such cost. In estimating such cost, no allowance shall be made to the Contractor for the use of tools not especially provided for this work, for general superintendence, or for any overhead expenses except liability insurance.

ARTICLE 11

Co-operation with Other Contractors

1. The Contractor shall conduct the work in such manner as not to interfere with other work being done by the City, by contract or otherwise, and if deemed necessary by the Commissioner, the work under this contract shall conform to the progress of said other work; shall co-operate with other contractors or employees who may be doing work for the City, and with public service corporations affected by the work, in arranging for storage places, connections, bracings, temporary support for structures, repairs, etc.

ARTICLE 12

Subcontracts

1. The Contractor, in any contract with a Subcontractor, shall provide that the Subcontractor shall be subject to all specifications, terms, provisions, conditions, requirements and liabilities set forth in this contract so far as such specifications, terms, provisions, conditions, requirements and liabilities are applicable to the work to be done under such Subcontract, and shall also provide that such Subcontract shall be terminated by the Contractor whenever the Commissioner shall certify to him in writing that in his opinion the work of the Subcontractor is unnecessarily or unreasonably delayed or that the Subcontractor has violated any of the provisions of this contract. The Contractor shall at once terminate such subcontract if the Commissioner, after certifying as aforesaid, shall in writing direct the Contractor to make such termination.

2. Subcontracts shall be made in writing and the Contractor shall furnish the Commissioner with a copy of his subcontracts on demand.

3. Pursuant to the provisions of M.G.L. Ch. 30, Sec. 39F (1), the following provisions are included in the General Conditions:

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring the payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of the subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority, the demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of the completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after which the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work (ii) specified in any court proceedings barring such payment, or, (iii) if the reply shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

ARTICLE 13

Responsibility for Work-Contractor's Responsibility

1. The Contractor has made his proposal from his own examinations and estimates, and shall not hold the City, its agents, or employees, responsible for or bound by, any schedule, estimate, sounding, boring, or any plan of any part of the work; shall, if any error in any plan, drawing, specification or direction relating to anything to be done under the contract come to his knowledge, report it at once to the Commissioner; shall not, except as the Commissioner shall authorize in writing, assign or sublet any part of the contract except for the supply of materials and plant, or of anything to be done thereunder; shall, subject to the provisions of the contract take all responsibility of, and bear all losses resulting to him in carrying on the contract, and shall assume the defense of, and hold the City, its agents and employees harmless from all suits and claims against them, or any of them, arising from the use of any invention, patent or patent right, material, labor or implement, by or from any act or omission or neglect of the Contractor, his Subcontractor, his agents or employees, in carrying on the contract, or for any liability of any nature arising under the contract. The Contractor shall be solely responsible and liable for, and shall fully protect and indemnify the City against all claims for damages to persons or

property occasioned by or resulting from blasting or other methods or processes in the work of construction, whether such damages be attributable to negligence of the Contractor, his employees or his Subcontractor or otherwise.

ARTICLE 14 LIGHTS-GUARDS

1. The Contractor shall assume all responsibilities of the work and take all proper precautions to protect persons and property from injury and unnecessary interference; leave a reasonably unobstructed way along public and private places for pedestrians, teams, and vehicles, and for access to hydrants; provide proper walks over or around any obstruction made in a public or private place in carrying on the contract, and maintain from the beginning of twilight through the whole of every night, on or near the obstruction sufficient lights and guards to protect travelers from injury thereby, and if, after one notification from the Commissioner that said lights and guards are not sufficient, the Contractor has not placed additional lights and guards to the satisfaction of the Commissioner, the Commissioner shall have the right to take charge of that part of the work at the expense of the Contractor. While the work is suspended he shall keep all roadways and sidewalks in proper condition, and when the work is completed put the place and vicinity in proper condition and so leave them.

The Contractor shall provide proper means of access to property where the existing access is cut off by the Contractor and replace or put in good condition every conduit, catch-basin, tree, wall, fence, or other thing injured by the Contractor in carrying on the contract, unless the same has been permanently done away with, on approval of the Commissioner, as being necessary to the proper carrying on of the contract.

ARTICLE 15 Guaranty

1. Any settlement or other defect, or the failure of any part of the structure or the work due to defective materials or workmanship, that occurs within one year after the work is completed, is to be immediately repaired by the Contractor. In the event of any such settlement, defect, or failure causing liability to the City for damage to persons or property, the Contractor does by this clause agree to hold the City harmless and to assume the defense of any claims therefor.

2. Responsibility under this guaranty for the adequacy of the work does not relieve the Contractor of his obligation to comply with the terms of the contract and to conform to all the requirements of the plans and specifications, nor does it give him the right to deviate in any way from the details of design of the structure or the work.

ARTICLE 16 Defective Work and Materials

1. The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his contract as herein described, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. If the work or materials, or any part thereof shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Engineer, and if any material brought upon the ground for use in the work or selected for the same, shall be condemned by the Engineer as unsuitable or not in conformity with the specifications, the Contractor shall forthwith remove such materials from the vicinity of the work. Nothing in this contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil, but all materials shall, upon being so attached or affixed, become the property of the City of Newton.

ARTICLE 17 Employment of Labor

1. The Contractor shall give preference in employment, first to citizens of Massachusetts, second, to other citizens of the United States; and shall allow all employees on said work to lodge, board and trade where they choose, and shall not obstruct any other person in doing work for the City; and shall conform to all labor laws of the Commonwealth; and no laborer or teamster, workman or mechanic working within this Commonwealth in the employ of the Contractor or Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the Contractor shall be requested to, or required to, or work more than eight hours in any one calendar day. This contract is subject to all the laws of the Commonwealth, and ordinances of the City and if any clause thereof does not conform to such laws and ordinances, such clause shall be void and such laws and ordinances operated in lieu thereof.

ARTICLE 18
Laws and Regulations - Contractor to Comply with Law

1. The Contractor shall keep fully informed of all existing or future acts of the legislature, and of all municipal ordinances, prohibitions, rules and regulations in any manner affecting the conduct of the work, and of all orders or decrees of any body or tribunal having any jurisdiction or authority over the materials, times, places and actions of those employed in the work embraced in the contract. The Contractor shall at all times observe and comply with all existing and future acts, ordinances, prohibitions, rules, regulations, orders and decrees; and shall protect and indemnify the city and its employees against any and all claims arising from or based on any violation of such acts, ordinances, prohibitions, rules, regulations, orders or decrees, and against all violations of law by the Contractor or his agents or employees.

END OF SECTION

CITY OF NEWTON

MINORITY/ WOMEN BUSINESS ENTERPRISE PLAN

DECEMBER 1, 1999

STATEMENT OF POLICY:

Whereas it is the policy of the government of the United States of America, the Commonwealth of Massachusetts and the City of Newton that no person shall be discriminated against in any manner whatsoever on the grounds of race, religion, color, sex, handicap or national origin; and

Whereas, it is the policy of the government of the United States of America that no person shall, on the grounds of race, color, sex or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program of activity funded entirely or in part by the City, the State or Federal government; and

Whereas, it is the policy of the government of the United States of America to encourage that Minority/Women Business Enterprises shall have the maximum practicable opportunity to participate in Federal and State assisted projects; and all City funded contracts; and

Whereas, it is the policy of the City of Newton to encourage that minority/women business enterprises shall have the maximum practicable opportunity to participate in all City funded contracts; and

Whereas, the City of Newton, as a recipient of Federal and State funds subscribes to the above policies and will fully comply With Federal, State and local laws and directives governing non-discrimination, equal opportunity and affirmative action in all municipal activities; and

Whereas, to further enunciate the equal opportunity policy of the City of Newton's Minority/Women Business Program, the following responsibilities are specified

This MINORITY/ WOMEN Business Enterprise Plan sets forth the administrative standards for the further implementation of the City of Newton's policy of the utilization of minority contractors and subcontractors.

The City of Newton strongly affirms that it will not discriminate in any contractual procedures against any persons because of race, color, religion, age, disability, sex or national origin. This policy shall be administered with a positive supportive attitude.

It is the responsibility of the City of Newton to take affirmative steps to implement this policy to insure equality of opportunity in conducting the Program including notifying those persons and businesses doing business with the City, that contracts for goods, services and construction, shall be made Without reference or regard to race, color, sex, age, handicap, religion or national origin.

David B. Cohen Mayor

CITY OF NEWTON
MINORITY/ WOMEN BUSINESS ENTERPRISE PLAN

DECEMBER 1, 1999

I. DEFINITIONS:

A. Minority Person- the term includes a person who is of Black Hispanic, Asian, American Indian or Cape Verdean origin.

B. Minority Business Enterprise (MBE) -- the term shall mean a business a) that is certified by SOMWBA; or b) provides evidence satisfactory to the City's Affirmative Action Officer that it is a business owned or controlled by one or more of the following:

- an individual who is a minority person,
- a partnership or joint venture controlled by minority persons in which at least 51 % of the ownership interest is held by minority persons or,
- a corporation or other entity controlled by minority persons and in which at least 51 % of the stock is owned by one or more minority persons.

C. Contract Compliance Officer - the Chief Procurement Officer or his/her designee responsible for the implementation of Newton's Minority/Women Enterprise Plan ("MWBE Plan") and activities.

D. MCAD - Massachusetts Commission Against Discrimination.

E. SOMWBA -- State Office of Minority/Women Business Assistance,

F. City - The City of Newton.

G. Women Business Enterprise (WBE) - the term shall mean a business a) that is certified by SOMWBA; or b) provides evidence satisfactory to the City's Affirmative Action Officer that it is a business owned or controlled by one or more of the following:

- an individual who is a woman.
- a partnership or joint venture controlled by women in which at least 51% of the ownership interest is held by women, or
- a corporation or other entity controlled by women and in which at least 51% of the stock is owned by one or more women.

H. MWBE – Minority or Women Business Enterprise

II. GOALS:

Newton's Minority/Women Enterprise Plan ("MWBE Plan") shall be guided by the goals presented below to promote minority/women opportunities within the City.

These goals comprise the framework for those activities to be implemented as part of the MWBE Plan:

To take affirmative action in expanding opportunities for minority and women owned firms in obtaining contracts within the City of Newton.

To assure that all contractors, regardless of race color, religion, creed, national origin, sex, age, ancestry or handicap, shall have equal opportunity to City contracting activities.

To award, of the total annual City contract dollars expended, 10 percent to MBE and 5 percent to WBE for construction; for goods and services, 5 percent WBE and 5 percent MBE.

III. SOLICITATION ACTIVITIES:

To notify MWBEs of upcoming contracts for construction, professional services and supplies, funded in whole or in part with Federal, State, and City funds, the following activities will be undertaken. In addition on a regular basis, the City of Newton will distribute to its listing of MWBEs and SOMWBA, a summary of upcoming contract opportunities which are subject to the City's MWBE Plan.

A. Construction Contracts

All construction contracts with an estimated value over \$50,000 will be formally advertised within local, regional, minority and special interest publications at least 14 days prior to the bid opening date.

For all such construction contracts a "Notice of Solicitation" of a project going out to bid will be distributed to appropriate SOMWBA or City certified firms at least 14 days prior to the bid opening date.

B. Contracts for Professional Services

The City of Newton will send notification of its advertised Request for Proposals to appropriate! SOMWBA or City certified firms Responding MWBE firms will be considered for contract award within the bounds of generally accepted management practice or with the applicable procurement law relating to securing the lowest cost and best services available.

C. Procurement of Supplies

The City of Newton will (where feasible) utilize MWBEs for the procurement of supplies in accordance with City purchasing procedures. These efforts will be documented and reported to MCAD, and the Mayor's office on a quarterly basis.

IV. CONSTRUCTION ACTIVITIES:

A. Goals

The City of Newton bid documents and contracts with an estimated value over \$50,000 will contain the City's goal of 10% for MBE and 5% for WBE utilization for subcontracts,

B. Pre-Bid Conference

To affirmatively further the opportunities available to prospective bidders, the City will hold a pre-bid conference 5-7 days prior to the bid opening date for all City construction contracts and subcontracts with an estimated value over \$50,000.

The pre-bid conference will provide an opportunity for contractors to: review and clarify the technical requirements of the projects, review the City's MWBE Plan; and review Equal Opportunity requirements. The City will advertise this conference and extend invitations to interested contractors as part of the notice of solicitation.

C. Bid Submission

All bids for City of Newton contracts with an estimated value over \$50,000 shall include a certification of intent to be completed by the bidder stating his/her intent to comply with the City's MWBE Plan. Failure to include this certification shall be an informality which may be waived if such certification is received prior to the award of the contract.

D. Contract Execution

Upon notification of award of the contract, the bidder shall provide a written plan detailing how it will comply with the MWBE Plan

E. Monitoring

Throughout the duration of the contract, the City of Newton through its Contract Compliance Officer, will monitor the progress and activities of all contractors and subcontractors as they attempt to comply with the MWBE Plan.

F. Enforcement

In the case of clear neglect to make a good faith effort to comply with this MWBE Plan, the City of Newton reserves the right to designate contractor, after a hearing, as ineligible for future City bid awards.

V. CONTRACT COMPLIANCE OFFICER/DUTIES AND RESPONSIBILITIES:

The Contract Compliance Officer, as liaison between minority firms and the City of Newton will have the overall responsibility for the implementation of Newton's MWBE Plan. This responsibility includes the development, management, dissemination of information; the provision of technical assistance to minority firms including clarification of procedures to be implemented; maintenance of relevant documentation; completion of reporting requirements; and performance of monitoring and evaluation activities; and maintenance and updating of listings of minority/women business.

The Contract Compliance Officer has oversight of all City procurements for construction, professional services and supplies and shall coordinate the implementation of the MWBE Plan with other City departments.

THE CITY OF NEWTON, MASSACHUSETTS
SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY
ANTI-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

- I. The requirements hereinafter set forth apply to construction contracts which involve an expenditure by the City of \$50,000 or more.
- II. For purposes of this contract "minority" refers to Asian Americans, Black, Hispanics American Indians and Cape Verdeans. The City refers to the City of Newton
- III. During the performance of this contract the Contractor and all of (his) Subcontractors (hereinafter collectively referred to as the Contractor) , for himself, his assignees, and successors ,in interest, agree as follows:
 1. In connection with the performance of work under this contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age or sex. The aforesaid provision shall include, but not be limited to, the following: layoff; termination; rates of pay or other forms of compensation; conditions or privileges of employment; and the selection of apprenticeship. The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the City setting forth the provisions of the Fair Employment Practices Law of the Commonwealth (MGL Chapter 151B) . (See Attachment A)
 2. In connection with the performance of work under this contract, the Contractor shall undertake in good faith, affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age or sex, and to eliminate and remedy any effects of such discrimination -in the past. Such affirmative action shall entail positive and aggressive measures to ensure equal employment: opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, 'Layoff or termination, rate of compensation, and in-service or apprenticeship training programs. This affirmative action shall include all action required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, age or sex. A 'purpose of- this provision is to ensure to the fullest extent possible an adequate supply of skilled tradesmen for this and future City public construction projects
- IV.
 1. As part of this obligation of remedial action under the foregoing section, the contractor shall maintain on this project a not less than 5 percent ratio of minority employee man hours to total man hours in each job category, including, but not limited to, bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers, and those "classes of work" enumerated in Section 44C of Chapter 149 of the Massachusetts General Laws.
 2. In the hiring of minority journeymen, apprentices, trainees and advanced trainees, the Contractor shall rely on referrals, from the Contractor's affirmative action program approved by the City, traditional referral methods utilized by the construction industry, and referrals from agencies, not more than three in number at any one time, designated by the Liaison Committee or the City.
- V.
 1. At the discretion of the City, there may be established for the life of this contract a body to be known as the Liaison Committee, The Liaison Committee shall be composed of the Compliance Officer and one representative each from the Departments administering this project, hereinafter called the administering Departments, and such other representatives as may be designated by the City.
 2. The Contractor (or, his/her agent, if any, designated by him/her as the onsite equal employment opportunity officer) shall recognize the Liaison Committee as the affirmative action body, and shall establish a continuing working relationship with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

3. The Contractor shall prepare manning tables on a quarterly basis.* These shall be broken down into projections, by week, for workers required in each trade. Copies shall be furnished one week in advance of the initiation of work and quarterly thereafter to the City and to the Liaison Committee.
4. Records of employment referral orders, prepared by the Contractor, shall be made available to the City and to the Liaison Committee on request.
5. The contractor shall prepare weekly reports in a form approved by the City of hours worked in each trade by each employee, identified as minority or non-minority. Copies of these reports shall be provided at the end of each week to the City and to the Liaison Committee.

* If job is less than three months, prepare for length of job.

- VI. If the Contractor shall use any sub contractor on any work performed under this contract, he/she shall take affirmative action to negotiate with qualified minority subcontractors. This affirmative action shall cover both pre-bid and post-bid periods. It shall include notification to the State Office of: Minority *Business Assistance* or As designee, while bids are in preparation, of all products, work or services for which the Contractor intends to negotiate bids.
- VII. In the employment of journeyman, apprentices, trainees, and advanced trainees, the Contractor shall give preference to citizens of the Commonwealth who have served in the armed forces of the United States in time of war and have been honorably discharged therefrom or released from active duty therein, and who are qualified to perform the work to which the employment relates, and, secondly to citizens of the Commonwealth generally, and, if such cannot be obtained in sufficient numbers, then to citizens of the United States
- VIII. A designee of the City and a designee of the Liaison Committee shall each have the right of access to the Construction site,
- IX. **Compliance with Requirements**
The Contractor shall comply with the provisions of Chapter 151B of the Massachusetts General Laws, which are herein incorporated by reference and made as amended by Executive Order 227, and of Chapter 151B as amended, of the Massachusetts General Laws, both of which are herein incorporated by reference and made a part of this contract.
- X. **Non-Discrimination**
The Contractor, in the performance of all work after award, and prior to completion of the contract work, will not discriminate on the grounds of race, color, religious creed, national origin, age or sex in employment practices, in the selection or retention of sub-contractors, or in the procurement of materials and rentals of equipment.
- XI. **Solicitations for sub-Contracts and for the Procurement of Materials and Equipment**
In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under his contract relative to non-discrimination and affirmative action.
- XII. **Bidders Certification Requirement**
1. The following certification statement will be inserted in the bid document just above the bidder's signature.

"The bidder hereby certifies he shall comply with the minority manpower ratio and specific action steps contained in the City of Newton, Massachusetts Supplemental Equal Employment-- Opportunity Anti-Discrimination and Affirmative Action Program. The Contractor receiving the award of the contract

shall be required to obtain from each of its subcontractors and submit to the contracting or, administering agency prior to the performance of any work under said contract a certification by said subcontractor, regardless of tier, that it will comply with the minority manpower ratio and specific affirmative action steps contained in the City of Newton Massachusetts Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.

XIII. Contractor's Certification

A Contractor's certification form must be signed by all successful low bidders prior to award by the City. A Contractor shall not be eligible for award of a contract unless the contractor has executed and submitted the Contractor's Certification, which shall be deemed a part of the resulting contract. (See Attachment B)

XIV. Subcontractor's Certification

Prior to the award of any subcontract, regardless of tier, the prospective subcontractor must execute and submit: to the Prime Contractor a subcontractor's certification setting forth the subcontractor's compliance with this program, which shall be deemed a part of the resulting subcontract. (See Attachment C)

XV. Compliance - Information, Reports and Sanctions

1. The Contractor will provide all information and reports Required by the administering department or, the City on instruction issued by either of them and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the City to affect the employment of personnel. This provision shall apply only to information pertinent to the City's supplementary affirmative action contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the administering department or the City as appropriate and shall set forth what efforts he/she has made to obtain the information.

2. Whenever the administering department, the City, or the Liaison Committee believes the General Contractor or any Subcontractor may not-, be operating in compliance with the terms of this Section, the City directly, or through its designated agent, shall conduct: an appropriate investigation, and may confer with the parties, to determine if such Contractor is operating in compliance with the terms of this Section. If the City or its agent finds the General Contractor or any Subcontractor not in compliance, it shall make a preliminary report on non-compliance, and notify such Contractor in writing of such steps as will in the judgement of the City or its agent bring such Contractor into compliance. In the event, that such Contractor fails or refuses to fully perform such steps, the City shall make a final report of non-compliance, and recommend to the administering department the imposition of one or more of the sanctions listed below. If, however, the City believes the General Contractor or any Subcontractor has taken or is taking every possible measure to achieve compliance, it shall not make a final report of non-compliance. within fourteen days at the receipt of the recommendations of the City, the administering department shall move to impose one or more of the following sanctions, as it may deem appropriate to attain full and effective enforcement:

(a) The recovery by the administering department from the General Contractor of 1/100 of 11 of the contract award price or \$1000 whichever sum is greater, in the nature of liquidated damages or if a Subcontractor is in non-compliance, the recovery by the administering department from the General Contractor, to be assessed by the General Contractor as a back charge against the Subcontractor, of 1/10 of 1% of the sub-contract price, or \$400 whichever sum is greater, in the nature of liquidated damages, for each week that such party fails or refuses to comply

(b) The suspension of any payment of part thereof due under the contract until such time as the General Contractor or any Subcontractor is able to demonstrate his compliance with the terms of the contract;

(c) The termination, or cancellation, of the contract, in whole or in part, unless the General Contractor or any Subcontractor is able to demonstrate within a specified time his/her compliance with the terms of the City's affirmative action construction contract requirements; OR,

(d) The denial to the General Contractor or any Subcontractor of the right to participate in any future contracts awarded by the administering department for a period of up to three years.

3. If at any time after the imposition of one or more of the above sanctions (unless the contract has been terminated), a Contractor is able to demonstrate that he/she is in compliance with this section, he/she may request the City to suspend the sanctions conditionally pending a final determination by the City as to whether the Contractor is in compliance. Upon final determination of the City, the administering department, based upon the recommendation of the City, shall either lift the sanctions or continue them.
4. Sanctions enumerated under Section XV shall not be imposed by the City except after the General Contractor or Subcontractor have had an opportunity for full and fair hearing with City. The non-compliance investigation shall be initiated without prior notice to the contractor. Any sanctions to be imposed shall be, set forth fully and completely in writing, and may then be appealed to the City in writing by the Contractor.

.XIV. **Severability**

The provisions of this section are severable, and if any of these provisions shall be held unconstitutional by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the remaining provisions.

FAIR EMPLOYMENT LAW

The Fair Employment Law declares that it is illegal to discriminate on the basis of race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability

IT IS UNLAWFUL:

- to print or circulate any advertisement or use any application form which directly or indirectly specifies any limitation on the basis of race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability.
- to discharge or refuse to hire any individual on the basis of their race, color, religious creed, national origin, sex, sexual orientation, age, ancestry, or disability.
- to discriminate against any individual in matters relating to compensation, terms, conditions, or privileges of employment because of their race, color, religious creed, national origin, sex, sexual orientation, age, ancestry or disability.
- to require a woman to leave her job at some arbitrary stage in her pregnancy or to refuse to let her return to work until a specified time set by the employer.
- to grant a female employee at least eight weeks leave for purposes of childbirth or to treat her absence differently than any other absence due to disability.
- to require an employee to remain at work during any day or part thereof that s/he observes as a religious holiday provided that the employee gives a ten-day notice and the absence does not cause undue hardship to the employer.
- to discharge or refuse to hire any person because of their failure to furnish information concerning admission to a center for the treatment of mentally ill persons.
- to discriminate against a job applicant for failure to furnish information, written or oral, concerning: A) an arrest, detention or disposition regarding a violation of law in which no conviction resulted; B) a first conviction for any of the following misdemeanors: driving under the influence, simple assault, speeding, minor traffic violations, disturbance of the peace; or C) conviction for a misdemeanor where the date of the conviction or end of period of incarceration, if any, occurred more than five years prior to the employment application, and the applicant has not been convicted of any offense within the five years immediately before the date of application.

RETALIATION

It is illegal to retaliate against any person because s/he has opposed any practices forbidden under this Chapter or because s/he has filed a complaint, testified, or assisted in any proceeding before the Commission. It is also illegal to aid, abet, incite, compel or coerce the doings of any of the acts forbidden under this Chapter or to attempt to do so.

SEXUAL HARASSMENT

151B:1,18 The term "sexual harassment" shall mean sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when (a) submission to or rejection of such advances, requests or conduct is made either explicitly or implicitly a term or condition of employment, or as a basis for employment decisions; (h) such advances,, requests or conduct have the purpose or effect of unreasonably interfering with an individual's work performance by creating an intimidating, hostile, humiliating or sexually offensive work environment.

COMPLAINTS

All complaints must be filed in writing. Information on the filing of complaints can be obtained by contacting the MASSACHUSETTS COMMISSION AGAINST DISCRIMINATION at the following locations:

Boston office:
One Ashburton Place
Room 601
Boston, MA 02108
(617) 727-3990

Springfield office:
436 Dwight Street
Suite 315
Springfield, MA 01103
(413) 739-2145

CITY OF NEWTON

Contractors Certification

A Contractor will not be eligible for award of a contract, unless such contractor has submitted the following certification, which is deemed a part of the resulting contract.

CONTRACTOR'S CERTIFICATION

Contractor's Name Certifies that:

1. it tends to use the following listed construction trades in the work under the contract _____
_____ and
2. will comply with the minority manpower ration and specific affirmative action steps contained herein;
and
3. will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor certification required by these bid conditions

(Signature of authorized representative of Contractor)

Any contract for the provision of goods or services to the City of Newton or any of its departments is subject to the ordinance creating the Human Rights Commission, as it may be amended from Lime to Lime. Any complaints within the purview shall be forwarded immediately to the contracting agency, and a copy shall be sent to the Human Rights Commission; any complaints received by the contracting agency shall be forwarded to the contractor, and a copy shall be sent to the Human Rights Commission.

Attachment C

CITY OF NEWTON

Subcontractors Certification

Prior to the award of any subcontract , regardless of tier, the prospective subcontractor must execute and submit to the Prime Contractor the following certification, which will be deemed a part of the resulting subcontract.

SUBCONTRACTOR'S CERTIFICATION

_____ Certifies that:
Contractor's Name

1. it tends to use the following listed construction trades in the work under the contract
_____ and
2. will comply with the minority manpower ration and specific affirmative action steps contained herein; and
3. will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor certification required by these bid conditions

Pursuant to M.G.L. Ch. 62C, Sec. 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

(Signature of authorized representative of Contractor)

In order to ensure that the said subcontractor's certification becomes part of all subcontracts under the prime contract, no subcontract shall be executed until an authorizee representative of the Administrative Agency administering this project has determined in writing, that the said certification has been incorporated in such subcontract, regardless of tier, Any subcontract executed without such written approval shall be void.

Any contract for the provision of goods or services to the City of Newton or any of its departments is subject to the ordinance creating the Human Rights Commission, as it may be amended from time to time. Any complaints within the purview shall be forwarded immediately to the contracting agency, and a copy shall be sent to the Human Rights Commission; any complaints received by the contracting agency shall be forwarded to the contractor, and a copy shall be sent to the Human Rights Commission.

END OF SECTION

CITY OF NEWTON

WAGE RATE REQUIREMENTS

1. GENERAL

- A.** This section summarizes the requirements for the payment of wages to laborers and mechanics employed under the Contract.
- B.** Other duties and requirements of law which may not be specified in this section apply and are inherently part of the Contract.

2. WAGE RATES

- A.** The rate per hour to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the Work shall not be less than the rate of wages in the attached "Minimum Wage Rates" as determined by the Commissioner of Labor and Industries. The schedule of prevailing wage rates will be updated annually for all public construction projects lasting longer than one (1) year. The contractor shall pay the prevailing wage rate set out in the applicable prevailing wage rate schedule. Increases in prevailing wage rates shall not be the basis for a change order.
- B.** Keep posted on the site a legible copy of said schedule. Keep on file the wage rates and classifications of labor employed on this Work in order that they may be available for inspection by the Owner, Administrator, or the Architect.
- C.** Apprentices employed pursuant to this determination of wage rates must be registered and approved by the State Apprenticeship Council wherever rates for journeymen or apprentices are not listed.
- D.** Pay reserve police officers employed on the Work the prevailing rate of wages paid to regular police officers as required by M.G.L. c 149, Sec. 34B, as amended. Such police officers shall be covered by Workmen's Compensation Insurance and Employers Liability Insurance by the Contractor.
- E.** The Contractor and all subcontractors shall, on a weekly basis throughout the term of the contract, provide to the City of Newton certified payroll affidavits verifying compliance with M.G.L. c.149, Sec. 27, 27A and 27B.
- F.** The Contractor and all subcontractors shall provide a Statement of Compliance within 15 days of the completion of its portion of the work. This statement shall be submitted to the Owner on the form found elsewhere in this section.
- G.** The Contractor shall maintain accurate and complete records, including payroll records, during the Contract term and for three years thereafter. Filings made by the Contractor pursuant to Clauses 47, 48 and 49 of the General Conditions shall be deemed to constitute compliance with State filing requirements under the Massachusetts Prevailing Wage Law.

END OF SECTION



DEVAL L. PAIRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates
As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOWL
Director of Labor
LAUREA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification	Effective Dates and Total Rates					
Construction						
(2 AXLE) DRIVER - EQUIPMENT	06/01/2009	\$43.780	12/01/2009	\$44.330	06/01/2010	\$44.930
	12/01/2010	\$45.530	06/01/2011	\$46.280	12/01/2011	\$46.940
	06/01/2012	\$47.590	12/01/2012	\$48.620		
(3 AXLE) DRIVER - EQUIPMENT	06/01/2009	\$43.830	12/01/2009	\$44.400	06/01/2010	\$45.000
	12/01/2010	\$45.600	06/01/2011	\$46.330	12/01/2011	\$47.010
	06/01/2012	\$47.660	12/01/2012	\$48.690		
(4 & 5 AXLE) DRIVER - EQUIPMENT	06/01/2009	\$43.970	12/01/2009	\$44.520	06/01/2010	\$45.120
	12/01/2010	\$45.720	06/01/2011	\$46.470	12/01/2011	\$47.130
	06/01/2012	\$47.780	12/01/2012	\$48.810		
ADS/SUBMERSIBLE PILOT	08/01/2009	\$102.480	08/01/2010	\$107.460	08/01/2011	\$112.980
AIR TRACK OPERATOR	06/01/2009	\$46.830	12/01/2009	\$47.830	06/01/2010	\$48.830
	12/01/2010	\$50.100	06/01/2011	\$51.100	12/01/2011	\$52.330
ASBESTOS REMOVER - PIPE/MECH. EQUIPT.	06/01/2009	\$39.230	12/01/2009	\$40.230		
ASPHALT RAKER	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
ASPHALT/CONCRETE/CRUSHER PLANT- ON SITE	06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780
	12/01/2010	\$61.030				
BACKHOE/FRONT-END LOADER	06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780
	12/01/2010	\$61.030				
BARC O-TYPE JUMPING TAMPER	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
BLOCK PAVER, RAMMER / CURB SETTER	06/01/2009	\$46.830	12/01/2009	\$47.830	06/01/2010	\$48.830
	12/01/2010	\$50.100	06/01/2011	\$51.100	12/01/2011	\$52.330
BOILER MAKER	10/01/2008	\$54.800				
APPRENTICE: BOILERMAKER - Local 29						
Rate	Step	1	2	3	4	5
1.5	%	43.00	43.00	70.00	73.00	80.00
						83.00
						90.00
						95.00
BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	08/01/2009	\$67.120	02/01/2010	\$68.010	08/01/2010	\$69.910
	02/01/2011	\$70.900	08/01/2011	\$73.000	02/01/2012	\$73.990
APPRENTICE: BRICK/PLASTER/CEMENT MASON - Local 3 Newton						
Rate	Step	1	2	3	4	5
1.5	%	30.00	40.00	70.00	80.00	90.00
BULLDOZER/GRADER/SCRAPER	06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
	12/01/2010	\$60.680				
CAISSON & UNDERPINNING BOTTOM MAN	06/01/2009	\$47.230	12/01/2009	\$48.230	06/01/2010	\$49.230
	12/01/2010	\$50.500	06/01/2011	\$51.500	12/01/2011	\$52.730
CAISSON & UNDERPINNING LAB ORER	06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
	12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 11/04/2009

Wage Request Number: 20091104-033

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DEVAL L. PATRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification	Effective Dates and Total Rates								
CAISSON & UNDERPINNING TOP MAN	06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100			
	12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600			
CARBIDE CORE DRILL OPERATOR	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330			
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830			
CARPENTER	09/01/2009	\$53.630	03/01/2010	\$54.500	09/01/2010	\$55.380			
	03/01/2011	\$56.230	09/01/2011	\$57.380	03/01/2012	\$58.500			
APPRENTICE: CARPENTER - Zone 2 Eastern MA									
Ratio	Step	1	2	3	4	5	6	7	8
1:5	%	50.00	60.00	70.00	75.00	80.00	80.00	90.00	90.00
CEMENT MAS ONRY/PLASTERING	08/01/2009	\$65.510	02/01/2010	\$66.200	08/01/2010	\$67.670			
	02/01/2011	\$68.440	08/01/2011	\$70.060	02/01/2012	\$70.830			
CHAINSAW OPERATOR	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330			
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830			
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780			
	12/01/2010	\$61.030							
COMPRESSOR OPERATOR	06/01/2009	\$47.070	12/01/2009	\$47.890	06/01/2010	\$48.810			
	12/01/2010	\$49.740							
DELEADER (BRIDGE)	07/01/2009	\$62.260	01/01/2010	\$63.410					
DEMO: ADZEMAN	06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100			
	12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600			
DEMO: BACKHOE/LOADER/HAMMER OPERATOR	06/01/2009	\$47.100	12/01/2009	\$48.100	06/01/2010	\$49.100			
	12/01/2010	\$50.330	06/01/2011	\$51.330	12/01/2011	\$52.600			
DEMO: BURNERS	06/01/2009	\$46.830	12/01/2009	\$47.830	06/01/2010	\$48.830			
	12/01/2010	\$50.100	06/01/2011	\$51.100	12/01/2011	\$52.330			
DEMO: CONCRETE CUTTER/SAWYER	06/01/2009	\$47.100	12/01/2009	\$48.100	06/01/2010	\$49.100			
	12/01/2010	\$50.330	06/01/2011	\$51.330	12/01/2011	\$52.600			
DEMO: JACKHAMMER OPERATOR	06/01/2009	\$46.830	12/01/2009	\$47.830	06/01/2010	\$48.830			
	12/01/2010	\$50.100	06/01/2011	\$51.100	12/01/2011	\$52.330			
DEMO: WRECKING LAB ORER	06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100			
	12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600			
DIRECTIONAL DRILL MACHINE OPERATOR	06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430			
	12/01/2010	\$60.680							
DIVER	08/01/2009	\$75.600	08/01/2010	\$78.890	08/01/2011	\$82.740			
DIVER TENDER	08/01/2009	\$60.240	08/01/2010	\$62.590	08/01/2011	\$65.340			
DIVER TENDER (EFFLUENT)	08/01/2009	\$79.440	08/01/2010	\$82.960	08/01/2011	\$87.090			
DIVERSLURRY (EFFLUENT)	08/01/2009	\$102.480	08/01/2010	\$107.410	08/01/2011	\$113.190			
ELECTRICIAN	09/01/2009	\$64.800	03/01/2010	\$66.030	09/01/2010	\$67.270			
	03/01/2011	\$68.510							

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 11/04/2009

Wage Request Number: 20091104-033

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DEVAL L. PAIRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification

Effective Dates and Total Rates

APPRENTICE: ELECTRICIAN - Local 103											
Ratio	Step	1	2	3	4	5	6	7	8	9	10
23 ***	%	40.00	40.00	45.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00
App Prior 1/1/03; 30.65/40.45/50.55/60.57/70/75/80											
ELEVATOR CONSTRUCTOR						01/01/2009	\$63.690	01/01/2010	\$65.190	01/01/2011	\$66.690
						01/01/2012	\$68.190				
APPRENTICE: ELEVATOR CONSTRUCTOR - Local 4											
Ratio	Step	1	2	3	4	5					
11	%	50.00	55.00	65.00	70.00	80.00					
Step 1-2 am 6 mos; Step 3-5 am 1 year											
ELEVATOR CONSTRUCTOR HELPER						01/01/2009	\$49.830	01/01/2010	\$51.330	01/01/2011	\$52.830
						01/01/2012	\$54.330				
FENCE & GUARD RAIL ERECTOR						06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
						12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
FIELD ENG. - INST. PERSON (BLDG, SITE, HVY CONST)						11/01/2009	\$55.830	05/01/2010	\$56.930	11/01/2010	\$58.190
						05/01/2011	\$59.430				
FIELD ENG. - ROD PERSON (BLDG, SITE, HVY CONST)						11/01/2009	\$40.870	05/01/2010	\$41.530	11/01/2010	\$42.250
						05/01/2011	\$42.980				
FIELD ENG.-CHIEF OF PARTY (BLDG, SITE, HVY CONST)						11/01/2009	\$57.210	05/01/2010	\$58.320	11/01/2010	\$59.570
						05/01/2011	\$60.820				
FIRE ALARM INSTALLER						09/01/2009	\$64.800	03/01/2010	\$66.030	09/01/2010	\$67.270
						03/01/2011	\$68.510				
FIRE ALARM REPAIR / MAINTENANCE						09/01/2009	\$52.870	03/01/2010	\$53.790	09/01/2010	\$54.720
						03/01/2011	\$55.660				
FIREMAN (ASST. ENGINEER)						06/01/2009	\$51.780	12/01/2009	\$52.740	06/01/2010	\$53.810
						12/01/2010	\$54.890				
FLAGGER & SIGNALER						06/01/2009	\$35.800	12/01/2009	\$35.800	06/01/2010	\$36.800
						12/01/2010	\$36.800	06/01/2011	\$37.800	12/01/2011	\$37.800
FLOORCOVERER						03/01/2009	\$58.380				
APPRENTICE: FLOORCOVERER - Local 2148 Zone I											
Ratio	Step	1	2	3	4	5	6	7	8		
11	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00		
Step am 750 hr.											
FORK LIFT/CHERRY PICKER						06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780
						12/01/2010	\$61.030				
GENERATOR/LIGHTING PLANT/HEATERS						06/01/2009	\$47.070	12/01/2009	\$47.890	06/01/2010	\$48.810
						12/01/2010	\$49.740				

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

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Issue Date: 11/04/2009

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DEVAL L. PAIRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification	Effective Dates and Total Rates					
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	07/01/2009	\$51.760	01/01/2010	\$52.910		
APPRENTICE: GLAZIER - Local 33 Zone 2						
Ratio Step	1	2	3	4	5	6
1:1 %	30.00	33.00	40.00	43.00	70.00	73.00
						80.00
						90.00
						Step am 750 hrs.
HOISTING ENGINEER/CRANES/GRADALLS	06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780
	12/01/2010	\$61.030				
APPRENTICE: HOIST/CRANE ENG - Local 4						
Ratio Step	1	2	3	4	5	6
1:4 %	33.00	40.00	43.00	70.00	73.00	80.00
						83.00
						90.00
HVAC (DUCTWORK)	08/01/2009	\$62.260	02/01/2010	\$63.510	08/01/2010	\$64.760
	02/01/2011	\$66.010	08/01/2011	\$67.260	02/01/2012	\$68.510
	08/01/2012	\$69.760	02/01/2013	\$71.010		
HVAC (ELECTRICAL CONTROLS)	09/01/2009	\$64.800	03/01/2010	\$66.030	09/01/2010	\$67.270
	03/01/2011	\$68.510				
HVAC (TESTING AND BALANCING - AIR)	08/01/2009	\$62.260	02/01/2010	\$63.510	08/01/2010	\$64.760
	02/01/2011	\$66.010	08/01/2011	\$67.260	02/01/2012	\$68.510
	08/01/2012	\$69.760	02/01/2013	\$71.010		
HVAC (TESTING AND BALANCING - WATER)	09/01/2009	\$67.480	03/01/2010	\$68.730		
HVAC MECHANIC	09/01/2009	\$67.480	03/01/2010	\$68.730		
HYDRAULIC DRILLS	06/01/2009	\$46.830	12/01/2009	\$47.830	06/01/2010	\$48.830
	12/01/2010	\$50.100	06/01/2011	\$51.100	12/01/2011	\$52.330
INSULATOR (PIPES & TANKS)	09/01/2009	\$59.260	09/01/2010	\$61.660		
APPRENTICE: ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston						
Ratio Step	1	2	3	4		
1:4 %	30.00	40.00	70.00	80.00		
						Step am 1 year
IRONWORKER/WELDER	09/16/2009	\$59.560	03/16/2010	\$60.960		
APPRENTICE: IRONWORKER - Local 7						
Ratio Step	1	2	3	4	5	6
%	40.00	70.00	75.00	80.00	83.00	90.00
						Structural 1:4; Ornamental 1:4
JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
LABORER	06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
	12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600

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DEVAL L. PAIRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates
As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOWL
Director of Labor
LAUREA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification		Effective Dates and Total Rates									
APPRENTICE: LABORER - Zone 1											
Ratio	Step	1	2	3	4						
1:5	%	40.00	70.00	80.00	90.00						
LABORER: CARPENTER TENDER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600
LABORER: CEMENT FINISHER TENDER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600
LABORER: MASON TENDER						06/01/2009	\$46.350	12/01/2009	\$47.350	06/01/2010	\$48.350
						12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.850
LABORER: MULTI-TRADE TENDER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600
LABORER: TREE REMOVER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600
This classification applies to the wholesale removal of standing trees including all associated trimming of branches and limbs, and applies to the removal of branches at locations not on or around utility lines.											
LASER BEAM OPERATOR						06/01/2009	\$46.350	12/01/2009	\$47.350	06/01/2010	\$48.350
						12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.850
MARBLE & TILE FINISHERS						08/01/2009	\$56.240	02/01/2010	\$56.930	08/01/2010	\$58.470
						02/01/2011	\$59.270	08/01/2011	\$60.930	02/01/2012	\$61.740
APPRENTICE: MARBLE-TILE-TERRAZZO FINISHER - Local 3 Marble & Tile											
Ratio	Step	1	2	3	4	5					
1:3	%	50.00	60.00	70.00	80.00	90.00					
Step and 800 hrs.											
MARBLE MASONS, TILELAYERS & TERRAZZO MECH						08/01/2009	\$67.160	02/01/2010	\$68.030	08/01/2010	\$69.930
						02/01/2011	\$70.940	08/01/2011	\$73.040	02/01/2012	\$74.030
APPRENTICE: MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile											
Ratio	Step	1	2	3	4	5					
1:3	%	50.00	60.00	70.00	80.00	90.00					
MECH. SWEEPER OPERATOR (NON-CONSTRUCTION)						07/01/2009	\$28.300	07/01/2010	\$29.000	07/01/2011	\$29.700
MECH. SWEEPER OPERATOR (ON CONST. SITES)						06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
						12/01/2010	\$60.680				
MECHANICS MAINTENANCE						06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
						12/01/2010	\$60.680				
MILLWRIGHT (Zone 1)						03/01/2009	\$54.400				
APPRENTICE: MILLWRIGHT - Local 1121 Zone 1											
Ratio	Step	1	2	3	4	5	6	7	8		
1:5	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00		

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DEVAL L. PAIRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification		Effective Dates and Total Rates							
MORTAR MIXER		06/01/2009	\$46.350	12/01/2009	\$47.350	06/01/2010	\$48.350		
		12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.600		
OILER (OTHER THAN TRUCK CRANES, GRADALLS)		06/01/2009	\$41.090	12/01/2009	\$41.750	06/01/2010	\$42.480		
		12/01/2010	\$43.220						
OILER (TRUCK CRANES, GRADALLS)		06/01/2009	\$43.990	12/01/2009	\$44.720	06/01/2010	\$45.550		
		12/01/2010	\$46.380						
OTHER POWER DRIVEN EQUIPMENT - CLASS II		06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430		
		12/01/2010	\$60.680						
PAINTER (BRIDGES/TANKS)		07/01/2009	\$62.260	01/01/2010	\$63.410				
APPRENTICE: PAINTER - Local 35 Zone 2									
Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00
Step am 750 hr.									
PAINTER (SPRAY ORS AND BLAST, NEW) *		07/01/2009	\$53.160	01/01/2010	\$54.310				
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.									
APPRENTICE: PAINTER - Local 35 Zone 2									
Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00
Step am 750 hr.									
PAINTER (SPRAY ORS AND BLAST, REPAINT)		07/01/2009	\$51.220	01/01/2010	\$52.370				
APPRENTICE: PAINTER - Local 35 Zone 2									
Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00
Step am 750 hr.									
PAINTER (TRAFFIC MARKINGS)		06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100		
		12/01/2010	\$49.350	06/01/2011	\$50.350	12/01/2011	\$51.600		
PAINTER / TAPER (BRUSH, NEW) *		07/01/2009	\$51.760	01/01/2010	\$52.910				
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.									
APPRENTICE: PAINTER - Local 35 Zone 2									
Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00
Step am 750 hr.									
PAINTER / TAPER (BRUSH, REPAINT)		07/01/2009	\$49.820	01/01/2010	\$50.970				

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DEVAL L. PATRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification		Effective Dates and Total Rates							
APPRENTICE: PAINTER - Local 33 Zone 2									
Ratio	Step	1	2	3	4	5	6	7	8
1:1	%	50.00	55.00	60.00	65.00	70.00	75.00	80.00	90.00
Step am 750 hrs.									
PANEL & PICKUP TRUCKS DRIVER						06/01/2009	\$43.610	12/01/2009	\$44.160
						12/01/2010	\$45.360	06/01/2011	\$46.110
						06/01/2012	\$47.420	12/01/2012	\$48.430
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)						08/01/2009	\$60.240	08/01/2010	\$62.590
PILED RIVER						08/01/2009	\$60.240	08/01/2010	\$62.590
								08/01/2011	\$65.340
APPRENTICE: PILE DRIVER - Local 34 Zone 1									
Ratio	Step	1	2	3	4	5	6	7	8
1:3	%	60.00	65.00	70.00	75.00	80.00	85.00	90.00	95.00
PIPEFITTER & STEAMFITTER						09/01/2009	\$67.480	03/01/2010	\$68.730
APPRENTICE: PIPEFITTER - Local 337									
Ratio	Step	1	2	3	4	5			
**	%	40.00	45.00	60.00	70.00	80.00			
**1:3; 3:15; 1:10 thereafter Step am 1 yr Ratign/AC Mechanic Steps & Hrs Same as above									
Ratign/AC Mechanic **1 1:1; 2:2; 4:3; 4:4; 8:5:10; 6:12; 7:14; 8:17; 9:20; 10:23(Max)									
PIPELAYER						06/01/2009	\$46.330	12/01/2009	\$47.330
						12/01/2010	\$49.600	06/01/2011	\$50.600
						09/01/2009	\$66.230	03/01/2010	\$67.500
PLUMBERS & GAS FITTERS									
APPRENTICE: PLUMBER - Local 12									
Ratio	Step	1	2	3	4	5			
**	%	35.00	40.00	55.00	65.00	75.00			
**1:2; 2:4; 3:10; 4:14; 5:19 Step am 1 year; Step 4 w/hrs am 70; Step 5 w/hrs am 80									
PNEUMATIC C CONTROLS (TEMP.)						09/01/2009	\$67.480	03/01/2010	\$68.730
PNEUMATIC DRILL/TOOL OPERATOR						06/01/2009	\$46.330	12/01/2009	\$47.330
						12/01/2010	\$49.600	06/01/2011	\$50.600
POWDERMAN & BLASTER						06/01/2009	\$47.100	12/01/2009	\$48.100
						12/01/2010	\$50.330	06/01/2011	\$51.330
POWER SHOVEL/DERRICK/TRENCHING MACHINE						06/01/2009	\$57.410	12/01/2009	\$58.530
						12/01/2010	\$61.030	06/01/2010	\$59.780
PUMP OPERATOR (CONCRETE)						06/01/2009	\$57.410	12/01/2009	\$58.530
						12/01/2010	\$61.030	06/01/2010	\$59.780
PUMP OPERATOR (DEWATERING, OTHER)						06/01/2009	\$47.070	12/01/2009	\$47.890
						12/01/2010	\$49.740	06/01/2010	\$48.810
READY-MIX CONCRETE DRIVER						05/01/2009	\$40.520	05/01/2010	\$41.080
								05/01/2011	\$41.690

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DEVAL L. PAIRICK
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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification	Effective Dates and Total Rates					
RECLAIMERS	06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
	12/01/2010	\$60.690				
RESIDENTIAL WOOD FRAME CARPENTER **	04/01/2009	\$35.620				
** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement.						
As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.						
RIDE-ON MOTORIZED BUGGY OPERATOR	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
ROLLERS/PREADER/MULCHING MACHINE	06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
	12/01/2010	\$60.690				
ROOFER (Inc. Roofer Waterproofing & Roofer Damproofing)	02/01/2009	\$53.860				
APPRENTICE: ROOFER - Local 33						
Ratio	Step	1	2	3	4	5
**	%	50.00	60.00	65.00	75.00	85.00
**1:3, 2:4 -10 thereafter 1:10 (or portion thereof) Step 1 is 2000 hrs; Steps 2-5 are 1000 hrs.						
Roofing (Reroofing): Same Steps and Hours as Above **1:4; Thereafter 1:1						
SHEETMETAL WORKER	08/01/2009	\$62.260	02/01/2010	\$63.510	08/01/2010	\$64.760
	02/01/2011	\$66.010	08/01/2011	\$67.260	02/01/2012	\$68.510
	08/01/2012	\$69.760	02/01/2013	\$71.010		
APPRENTICE: SHEET METAL WORKER - Local 17-A						
Ratio	Step	1	2	3	4	5
1+	%	40.00	45.00	50.00	60.00	75.00
Step 1-3 are 1 year; Steps 4-7 are 6 mos.						
SIGNERECTOR	06/01/2009	\$37.780				
APPRENTICE: SIGNERECTOR - Local 35 Zone 2						
Ratio	Step	1	2	3	4	5
1:1	%	50.00	55.00	60.00	65.00	70.00
Step 6 is 4 mos.						
SLATE/TILE/PRECAST CONCRETE ROOFER	02/01/2009	\$54.110				
SPECIALIZED EARTH MOVING EQUIP < 35 TONS	06/01/2009	\$44.070	12/01/2009	\$44.620	06/01/2010	\$45.220
	12/01/2010	\$45.820	06/01/2011	\$46.570	12/01/2011	\$47.230
	06/01/2012	\$47.880	12/01/2012	\$48.910		
SPECIALIZED EARTH MOVING EQUIP > 35 TONS	06/01/2009	\$44.360	12/01/2009	\$44.910	06/01/2010	\$45.510
	12/01/2010	\$46.110	06/01/2011	\$46.860	12/01/2011	\$47.520
	06/01/2012	\$48.170	12/01/2012	\$49.200		
SPRINKLER FITTER	09/16/2009	\$68.430	03/16/2010	\$69.700		

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 11/04/2009

Wage Request Number: 20091104-033

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DEVAL L. PATRICK
Governor
TIMOTHY P. MURRAY
Lieutenant Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Division of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification		Effective Dates and Total Rates									
APPRENTICE: SPRINKLER FITTER - Local 550											
Ratio	Step	1	2	3	4	5	6	7	8	9	10
1:1	%	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00
STEAM BOILER OPERATOR						06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
						12/01/2010	\$60.680				
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN						06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
						12/01/2010	\$60.680				
TELECOMMUNICATION TECHNICIAN						09/01/2009	\$52.870	03/01/2010	\$53.790	09/01/2010	\$54.720
						03/01/2011	\$55.660				
APPRENTICE: TELECOMMUNICATION TECHNICIAN - Local 103											
Ratio	Step	1	2	3	4	5	6	7	8		
1:1	%	40.00	45.00	50.00	55.00	60.00	65.00	70.00	80.00		
TERRAZZO FINISHERS						08/01/2009	\$66.060	02/01/2010	\$66.930	08/01/2010	\$68.830
						02/01/2011	\$69.840	08/01/2011	\$71.940	02/01/2012	\$72.930
APPRENTICE: MARBLE-TILE-TERRAZZO FINISHER - Local 3 Marble & Tile											
Ratio	Step	1	2	3	4	5					
1:3	%	50.00	60.00	70.00	80.00	90.00					
Step on 800 hrs.											
TEST BORING DRILLER						06/01/2009	\$47.500	12/01/2009	\$48.500	06/01/2010	\$49.500
						12/01/2010	\$50.750	06/01/2011	\$51.750	12/01/2011	\$53.000
TEST BORING DRILLER HELPER						06/01/2009	\$46.220	12/01/2009	\$47.220	06/01/2010	\$48.220
						12/01/2010	\$49.470	06/01/2011	\$50.470	12/01/2011	\$51.720
TEST BORING LABORER						06/01/2009	\$46.100	12/01/2009	\$47.100	06/01/2010	\$48.100
						12/01/2010	\$49.330	06/01/2011	\$50.330	12/01/2011	\$51.600
TRACTORS/PORTABLE STEAM GENERATORS						06/01/2009	\$57.090	12/01/2009	\$58.190	06/01/2010	\$59.430
						12/01/2010	\$60.680				
TRAILERS FOR EARTH MOVING EQUIPMENT						06/01/2009	\$44.630	12/01/2009	\$45.200	06/01/2010	\$45.800
						12/01/2010	\$46.400	06/01/2011	\$47.130	12/01/2011	\$47.810
						06/01/2012	\$48.460	12/01/2012	\$49.490		
TUNNEL WORK - COMPRESSED AIR						06/01/2009	\$58.430	12/01/2009	\$59.680	06/01/2010	\$60.930
						12/01/2010	\$62.180	06/01/2011	\$63.430	12/01/2011	\$64.680
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)						06/01/2009	\$60.430	12/01/2009	\$61.680	06/01/2010	\$62.930
						12/01/2010	\$64.180	06/01/2011	\$65.430	12/01/2011	\$66.680
TUNNEL WORK - FREE AIR						06/01/2009	\$50.500	12/01/2009	\$51.750	06/01/2010	\$53.000
						12/01/2010	\$54.250	06/01/2011	\$55.500	12/01/2011	\$56.750
TUNNEL WORK - FREE AIR (HAZ. WASTE)						06/01/2009	\$52.500	12/01/2009	\$53.750	06/01/2010	\$55.000
						12/01/2010	\$56.250	06/01/2011	\$57.500	12/01/2011	\$58.750

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 11/04/2009

Wage Request Number: 20091104-033

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DEVAL L. PAIRICK
Governor
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THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DIVISION OF OCCUPATIONAL SAFETY

Prevailing Wage Rates

As determined by the Commissioner under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H



SUZANNE M. BUMP
Secretary of Labor and Workforce Development
GEORGE NOEL
Director of Labor
LAURA M. MARLIN
Commissioner of Division of Occupational Safety

Awarding Authority: City of Newton

Contract Number: 10-26

City/Town: NEWTON

Description of Work: Area B Sewer Rehabilitation - Phase 1

Job Location: Various Locations in Newton

Classification	Effective Dates and Total Rates					
VAC-HAUL	06/01/2009	\$44.070	12/01/2009	\$44.620	06/01/2010	\$45.220
	12/01/2010	\$45.820	06/01/2011	\$46.570	12/01/2011	\$47.230
	06/01/2012	\$47.880	12/01/2012	\$48.910		
WAGONDRILL OPERATOR	06/01/2009	\$46.330	12/01/2009	\$47.330	06/01/2010	\$48.330
	12/01/2010	\$49.600	06/01/2011	\$50.600	12/01/2011	\$51.830
WASTEWATER PUMP OPERATOR	06/01/2009	\$57.410	12/01/2009	\$58.530	06/01/2010	\$59.780
	12/01/2010	\$61.030				
WATER METER INSTALLER	09/01/2009	\$66.230	03/01/2010	\$67.500		

Additional Apprentice Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours) unless otherwise specified.

- * Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof.
- ** Multiple ratios are listed in the comment field.
- *** The job site ratio of 2 apprentices (APP) for every 3 journeymen (JM) is allowed as follows:
1 JM: 1 APP; 2-3 JM: 2 APP; 4-6 JM: 4 APP; 7-9 JM: 6 APP; 10-12 JM: 8 APP; 13-15 JM: 10 APP; etc.
- **** The job site ratio of 2 apprentices (APP) for every 3 journeymen (JM) is allowed as follows:

This wage schedule must be posted at the work site in accordance with M.G.L. ch. 149, sec. 27

Failure of the employer to pay "prevailing wage rates," which are the minimum wage rates listed above, on public works projects is a violation of M.G.L. ch. 149, sec. 27. Employees not receiving such rates should report the violation to the Office of Fair Labor and Business Practices, 100 Cambridge Street, Boston, MA 02108; Tel: 617-727-3465.

Issue Date: 11/04/2009

Wage Request Number: 20091104-033

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The Massachusetts Prevailing Wage Law

M.G.L. ch. 149, §§ 26 – 27

NOTICE TO AWARDING AUTHORITIES

- 'The enclosed wage schedule applies only to the specific project listed at the top and will be updated for any public construction project lasting longer than one (1) year.
- 'You should request an updated wage schedule from the Division of Occupational Safety if you have not opened bids or selected a contractor within 90 days of the date of issuance of the enclosed wage schedule.
- 'The wage schedule shall be incorporated in any advertisement or call for bids for the project for which it has been issued.
- 'Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project.

NOTICE TO CONTRACTORS

- The enclosed wage schedule, and any updated schedule, must be posted in a conspicuous place at the work site during the life of the project.
- The wages listed on the enclosed wage schedule must be paid to employees on public works projects regardless of whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- The enclosed wage schedule applies to all phases of the project including the final clean-up. Contractors whose only role is to perform final clean-up must pay their employees according to this wage schedule.
- All apprentices must be registered with the Massachusetts Division of Apprentice Training in order to be paid at the reduced apprentice rates. If a worker is not registered with the Division of Apprentice Training, they must be paid the “total rate” listed on the wage schedule regardless of experience or skill level. For further information, please call (617) 727-3486 or write to the Division of Apprentice Training, 399 Washington Street, 4th Floor, Boston, MA 02108

WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

In addition, every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years.

In addition, each such contractor, subcontractor or public body shall furnish to the Department of Labor & Workforce Development/Division of Occupational Safety within fifteen days after completion of its portion of the work a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 19____

I, _____,
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

DIVISION OF OCCUPATIONAL SAFETY, 399 WASHINGTON STREET, 5TH FL., BOSTON, MA. 02108

CITY OF NEWTON
SUMMARY OF WORK AND SPECIFIC REQUIREMENTS OF THE CONTRACT
FOR PUBLIC WORKS CONSTRUCTION

I. SUMMARY OF WORK

A. The Work under the Contract consists of:

1. **Base Bid:** Cleaning and inspection of 17,526 lf of sewers, 85 lf of open cut repairs, 3,918 vf of cementitious lining of manholes, 47 lf of cured-in-place short liners, 29,794 lf of cured-in-place pipe and reinstatement of 426 service connections, and 94 access port repairs.

Alternate Bid No. 1: Cementitious lining of 622 vf of manholes and 29 access port repairs.

Alternate Bid No. 2: Installation of 5,703 lf of cured-in-place pipe and reinstatement of 90 service connections.

2. All other work described in the Project Manual and/or shown on the Plan(s) unless specifically indicated as not to be done.

B. In addition the work under the contract includes:

1. Work outside the Project Site as called for in the Project Manual and/or Plan(s) and as required for the performance of the work.
2. The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.
3. All labor, materials, tools, and equipment necessary to do all the work required for the completion of each item as specified, which shall limited not only to the exact intent mentioned, but shall include incidental work necessary or customarily performed for the completion of that item.
4. All items not specifically mentioned or noted in the Project Manual and/or Plan(s), but which are obviously necessary to make a complete working installation.

C. The Proposed Contract Price shall be complete costs, including overhead, profit, insurance, transportation, and all other costs connected with, or incidental to the work described.

II. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. Upon notification the Contractor shall commence the work specified in the Project Manual as directed by the City. The work shall proceed in a continuous uninterrupted fashion with adequately staffed crews, in a satisfactory manner, which will assure that the work is completed in a timely manner to the satisfaction of the City.

B. The work within this contract must be brought to final substantial completion, exclusive of final paving and re-test inspection, within 230 calendar days or if selected the Base Bid and Alternate 1 within 260 calendar days, or if selected the Base Bid and Alternate 1 and Alternate 2 within 260 calendar days of the start date fixed in the "Notice to Proceed. The contractor shall complete re-test inspection, for any work completed in the Base Bid, Alternate 1, and Alternate 2, within 56 calendar days of commencement of re-test inspection. Liquidated damages, as designated in Article 7, shall apply to the Contract and the retest period. Time is of the essence in the performance of the work of this contract. Bidders attention is directed to the provisions in the Project Manual regarding the assessment of liquidated damages for failure to complete the work within the time specified. Award will be made to the bidder with the lowest total contract price that is deemed to be responsible and eligible.

Time is of the essence for the completion of this contract. If the Contractor fails to achieve substantial or final completion of the Work within the time required by the contract, and unless an extension of time is granted, the Contractor shall pay to the City as liquidated damages, the applicable amount specified in **Article 7** of the **General Conditions** for each day of delay. If different completion dates are specified in the Contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay

or nonperformance is excused under another section in this Contract, liquidated damages shall not be due the City. The Contractor remains liable for damages caused other than by delay.

III. INSURANCE REQUIREMENTS

- A. The Contractor shall carry and maintain until acceptance of the work such Workmen's Compensation , Automobile Liability, Public Liability, Contingent Public Liability, Property Damage and Contingent Property Damage Insurance, each including blasting coverage, as shall protect him and any sub-contractor performing work covered by this contract from all claims and liability for damages for personal injury, including accidental death, and for property damage which may arise from operations under this contract, whether such operations be by himself or by any sub-contractor or by any one directly or indirectly employed by either of them.
- B. The City shall be named as an additional insured on such policy.
- C. The amounts of such insurance shall be as follows:
 - 1. Workmen's Compensation Insurance as required by Massachusetts General Law.
 - 2. Automobile Liability Insurance on all vehicles owned or hired for a.) Bodily Injury in an amount not less than \$500,000.00 for each occurrence, and not less than \$1,000,000.00 aggregate; b.) Property Damage in an amount not less than \$250,000.00 each occurrence, and not less than \$500,000.00 aggregate.
 - 3. Public Liability Insurance and Contingent Public Liability Insurance in an amount not less than \$500,000.00 for injuries, including accidental death to any one person, and subject to the same limit for each person, in an amount not less than \$1,000,000.00 on account of one accident.
 - 4. Property Damage Insurance and Contingent Property Damage Insurance in an amount not less than \$250,000.00 on account of one accident, and in an amount of not less than \$500,000.00 on account of all accidents.
 - 5. General Liability Insurance shall include Contractual Liability Insurance.
- D. Before any work is started, the successful bidder shall be required to file with the Chief Procurement Officer certificates of insurance coverage as detailed above, with policy numbers and dates of expiration.
- E. The Contractor shall indemnify, hold harmless and defend the City and its departments, officers, employees, servants, and agents from and against all actions, causes of actions, claims, demands, damages, costs, loss of services, expenses and compensation, including attorney's fees and interest arising out of or resulting directly or indirectly from the services rendered pursuant to this Contract, provided that any such action, cause of action, claim, demand, damage, cost, loss of service, expense, compensation (1) in any way grows out of bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, which (2) is caused in whole or in part by any act or omission of the Contractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

END OF SUMMARY OF WORK

**CITY OF NEWTON
SPECIAL CONDITIONS OF THE CONTRACT
FOR PUBLIC WORKS CONSTRUCTION**

The following Special Conditions supplement the City of Newton General Conditions of the Contract for Public Works Construction. The following clauses relate in particular to this contract. In the event of conflict or ambiguity between the General Conditions and these Special Conditions, the Special Conditions take precedence and shall govern.

1. The Contractor shall provide such police officers as the Engineer deems necessary for the direction and control of traffic entering, passing through and leaving the site of the contract. Such officers shall wear regulation policemen's uniforms and fluorescent safety vests. The City will reimburse the Contractor for payments made for the services of all traffic officers. The Contractor is required to submit to the Engineer copies of evidence of payment.
2. Unless otherwise specified elsewhere in this contract or specifically directed by the Engineer, all excavated material shall be wasted off-site at the Contractors' expense. No City of Newton disposal area will be available for this purpose.
3. The Contractor shall make his own arrangements with the owners of land other than the City easements occupied by or used by him in the prosecution of this contract and shall hold the City harmless from any and all claims for damages caused by or arising from such occupation or use. All temporary roadways built to accommodate equipment, trucks, etc., shall be built at the Contractor's own expense.
4. The City does not guarantee the locations of existing pipes or underground conduits. The locations of these structures shown on the plans are approximate. In private lands where sprinkler systems, driveway, walk and step heating cables and/or heating pipes are encountered, the Contractor shall use due caution when excavating in the vicinity of these structures.
5. The City does not guarantee the nature of any material encountered in any excavation. The Contractor must make his own examination, by boring, test holes, or otherwise, for determining the nature of the material to be excavated or the conditions under which the work is to be performed, and make his bid in sole reliance thereon.
6. The Contractor shall clean up the entire project before the City will accept the work. All rubbish, tree stumps, boulders from any excavation, surplus excavated material, unless specifically ordered by the Engineer to do otherwise, or any other debris shall be disposed of by the Contractor. The entire area within the easements and all other areas disturbed by the Contractor shall be graded and left in a condition comparable to that as found originally and satisfactory to the Engineer. All the work mentioned in this paragraph shall be included in the Furnishing, Trenching and Laying Item.
7. All trenches and areas resurfaced by the Contractor shall be guaranteed against settlement, upheaval or failure of any kind for a period of one (1) year after the City accepts the work and he shall replace such resurfacing at his own expense. The City Engineer shall be sole judge as to what constitutes a failure and which portion of the resurfacing is to be replaced, and his decision shall be final.
8. Before starting the work and from time to time during its progress, as the Engineer may request, the Contractor shall submit to the Engineer a written description of the methods he plans to use in doing the work and the various steps he intends to take.
9. The terms "earth excavation" and "excavation" used throughout these specifications shall include all the material to be excavated and/or removed (except rock excavation) including peat, muck, roots, trees, stumps, and all other material necessary for the completion of the work to be done as specified.
10. The term "complete in place" used throughout these specifications shall include all the work to be done for the completion of the item as specified.
11. The Contractor shall cooperate with other Contractors, Utility Companies and/or City of Newton Departments that may be working on or near the work site covered by the contract. The Engineer will decide as to the respective rights of the parties involved and his decisions shall be final.
12. The Contractor shall assume all liability, financial or otherwise, in connection with this contract and shall protect and save harmless the City of Newton for any and all damages or claims that may arise because of inconveniences, delays or loss

experienced by him because of the presence and operations of other Contractors, Utility Companies and/or City of Newton Departments working near or within the limits of the contract.

13. The Contractor shall begin on receipt of written orders to do so, and the work once begun shall be continuously carried forward with a force of men adequate in the opinion of the Engineer to complete the work in a reasonable and expeditious manner, inclement and unseasonable weather conditions excepted. In the event the Engineer determines that the Contractor has not begun work on written orders to do so, or that the work once begun has been abandoned without authority, then the Engineer shall give the Contractor seventy-two (72) hours notice (Sunday excepted) to begin work, or resume work in case of abandonment. Failure of the Contractor to act within this specified time shall be deemed a breach of this contract and the Contractor shall be held liable for any damage or expense arising from such breach of contract.
14. Upon commencement of the work the Contractor shall assume full charge and care thereof and he shall take every necessary precaution against injury or damage to the work by action of the elements, or from any cause whatever, whether arising from the execution or the non-execution of the contract. The Contractor shall bear all losses resulting to him on account of the amount or character of the work or because the nature of the land in or on which the work is done is different from what was estimated or expected, or on account of the weather elements or other causes.
15. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any of the above causes before the completion and final acceptance of the work, and shall bear the expense thereof.
16. All notices, demands, requests, instructions, approvals and claims must be in writing. Any such notice shall be deemed to have been given as of the time of delivery, or of actual receipt in the case of telegrams or, in the case of mailing, when it should have been received in due course of post. For communicating purposes, the office address of the Contractor shall be that stated on the signature page of the contract; that of the City shall be as stated in the Notice to Contractors. Any subsequent change in address of either party shall be communicated to the other in writing.
17. The City will furnish to the Contractor, without charge, all copies of the specifications reasonably necessary in the performance of the contract work.
18. The Contractor shall supply to the City the name and telephone number of a responsible person who may be contacted during off-hour emergencies on the project. The Contractor shall cooperate at all times with the City and the Project Manager, and ensure the cooperation of his key personnel and that of his subcontractors.
19. The work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient men and adequate equipment to complete all the necessary work requirements within a minimum period of time. The work shall be conducted between the hours of 7:00 a.m. and 4:30 p.m. on Monday through Friday. No work shall be done on holidays, Saturdays or Sundays other than for emergencies, or unless specifically authorized by the City.
20. The Contractor shall, with each monthly invoice submitted during the term of this Contract, submit to the City two (2) legible copies of his payrolls documenting the wages paid to all employees performing on site labor relating to the work of this Contract. These copies shall be prepared on forms supplied by the City.
21.
 - a.) Unless specifically so stated to the contrary the use of a manufacturer's name or style number is not restrictive, and is intended solely as an identification of the type and quality of the materials and services required. In all cases, the words "or approved equal" if not inserted are implied.
 - b.) An item equal to that named or described in the specifications may upon written approval of the City be furnished by the Contractor. An item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design; (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased; (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the specifications.
 - c.) The name and identification of all materials other than the one specifically named shall be submitted to the City in writing for approval, prior to purchase, use or fabrication of such items. Subject to the provisions of M.G.L. Ch. 30, Sec. 39J, approval shall be at the sole discretion of the City, shall be in writing to be effective, and the decision of the City shall be final. The City may require tests of all materials so submitted to establish quality standards at the Contractor's expense.
 - d.) For the use of material other than the one specified, the Contractor shall assume the cost of and responsibility for satisfactorily accomplishing all changes in the work as shown. All directions, specifications and

recommendations by manufacturers for the installation, handling, storing, adjustment, and operation of their equipment shall be complied with and responsibility for proper performance shall continue to rest with the Contractor.

- f.) Except as otherwise provided for by the provisions of M.G.L. Ch. 30, Sec. 39J, the Contractor shall not have any right of appeal from the decision of the City condemning any materials furnished if the Contractor fails to obtain the approval for substitution in accordance with these provisions. If any substitution is more costly, the Contractor shall pay for such costs.
22. In addition to other guarantees or warranties required under law or other sections of the specification, the Contractor warrants all materials furnished and labor performed under this Contract to be free from defects or errors in workmanship or installation for a period of one year from the date of Completion of the work, as certified by the Project Manager. The Contractor shall indemnify the City of Newton for the full cost of any damage to the property that may result by reason of such defects or errors and shall indemnify the City of Newton from and against any and all claims, demands, losses, costs, expenses, liabilities and damages, including reasonable attorney's fees and expenses, arising out of or on account of this Contract, including but not limited to claims brought against the City of Newton for alleged infringement of patents based upon any methods of construction or application of upon materials furnished under the Contract.
23. The Contractor shall make no excavation in any public way or utility easement unless at least seventy-two (72) hours, exclusive of Saturdays, Sundays and legal holidays, before the proposed excavation is to be made, he has given notice in writing by registered mail, of the proposed excavation to such Public Utility Companies as supply gas, electricity and telephone service in the City, to such private companies as supply cable television service in the City, the Massachusetts Water Resources Authority (MWRA) and also to the City of Newton Water Department. Such notice shall set forth the name of the street and a reasonably accurate description of the location in which the excavation is to be made. The Contractor shall comply with the Dig Safe Law (G.L. c. 82, Sec. 40).
24. The Contractor shall exercise the greatest of care to ensure that no material being hauled either to or from the site by him or his sub-contractor's, is spilled onto any way, public or private, within the City limits. In the event that such spillage does occur, it shall be the Contractors' responsibility to remove the spilled material and clean the area by the end of the work day. If in the judgment of the Engineer, the Contractor has not satisfactorily cleaned the area of any spill, the Engineer may then order the area to be cleaned by the City at the Contractors' expense.
25. No cement or bituminous concrete shall be poured from October 30 to April 15, unless the Contractor receives prior written authority to do so from the Commissioner of Public Works.
26. By submitting a bid Contractor represents and warrants that it has the capability to perform in a year 2000 compliant manner. For the purpose of this paragraph "year 2000 compliant" means that Contractor will continue to perform in accordance with all requirements of this Agreement from, into and between the twentieth and twenty-first centuries, without delay or interruption in performance or delivery of services relating to the ability of systems used by the Contractor, or by parties upon whom the Contractor relies in the performance of this Agreement, to accurately interpret, convert, or process date/time data in electronic format.

END OF SECTION

DRAWINGS

DRAWINGS - 22 Pages

DRAWINGS MUST BE OBTAINED THROUGH THE PURCHASING DEPARTMENT. HOWEVER, THE CONTRACTOR IS ADVISED TO CALL AHEAD TO ENSURE THAT A COMPLETE SET OF DRAWINGS IS READILY AVAILABLE. (617-796-1220)

END OF SECTION

TV INSPECTION LOGS AND MH INSPECTION REPORTS
PROVIDED BY THE OWNER

PART I - GENERAL

1.01 PURPOSE:

A. PURPOSE OF LOGS, REPORTS AND FIELD OBSERVATIONS:

1. The purpose of the TV Inspection Logs and Manhole Inspection Reports was to determine the condition of the existing sewer system and assess the extent of cleaning, repairs and/or replacement required for the system.
2. The inspections and observations provided information to prepare the design specifications included in these contract documents and to meet the requirements of the Owner.
3. Information reported from the TV Inspection Logs and Manhole Inspection Reports are those observed in the field at the particular location and time the observations were made, and do not necessarily represent the present conditions.

1.02 SCOPE:

A. TV INSPECTION LOGS:

1. TV Inspection of existing pipelines has been performed, with reasonable care. The results of the inspection program are appended hereto and are a part of the Contract Documents. Videos of what was encountered at the time of the inspection may be seen by appointment, upon request, during the bidding period at the office of Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts, or at the office of the Owner, which ever is appropriate. Contractors may, after obtaining Owner's permission, carry out additional pipeline inspection, at no expense to the Owner.
2. TV Inspection Logs provided in the Contract Documents are limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. TV Inspections have been taken substantially at the locations indicated on the drawings and shown on the logs. Information presented in the inspection logs, as to the pipe condition, material build up in the pipe; etc. is based on visual observation from the videos. Information reported on the TV Inspection logs are those observed in the field at the particular location and at the time the videos were taken, and do not necessarily represent the present conditions. Condition of the pipeline, material build up in the pipe, and other factors may differ now from those originally observed. Contractors should be aware that present conditions might affect methods of construction.

B. MANHOLE INSPECTION FORMS:

1. Manhole Inspections of existing manhole structures have been performed, with reasonable care. The results of the inspection programs are appended hereto and are a part of the Contract Documents. Contractors may, after obtaining Owner's permission, carry out additional manhole inspections at no expense to the Owner.
2. Manhole Inspection Reports provided in the Contract Documents are limited by the methods used for obtaining and expressing such data, and is subject to various interpretations. The terms used to describe conditions encountered are subject to local usage and individual interpretation.
3. Manhole Inspection Reports have been taken substantially at the locations indicated on the drawings and shown on the logs. Information presented in the inspection logs, as to extent of manhole failure, infiltration rates; material build up in the manholes; etc. is based on visual observation. Information reported on the Manhole Inspection Reports is those observed in the field at the particular location and at the time observations were made, and do not necessarily represent the present conditions. Condition of the manholes, infiltration rates, and material build up in the manholes, and other factors may differ now from those originally observed. The Contractors should be aware that present conditions might affect methods of construction.

PART II – MATERIALS – NOT APPLICABLE

PART III. EXECUTION

3.01 EXECUTION:

- A. TV Inspection Logs and Manhole Inspection Reports are for the general information of the Contractors and are included with these Contract Documents as Appendix A. The Contractors are obligated, to examine the site, records of investigations and other data pertinent to the site, and then, based upon their own interpretations and investigations, decide the character and quantity of material to be encountered, the difficulties or obstacles likely to be encountered, and other conditions affecting the work. The TV Inspection Logs and Manhole Inspection Reports are accurate only at the particular locations and times the original inspections were made. No other warranty, either expressed or implied, by the Owner, Engineer or their agents is made to the accuracy of the information contained on TV Inspection Logs, Manhole Inspection Reports, or other data shown on the drawings or presented in the Contract Documents.

END OF SECTION

SECTION 00890

PERMITS

1. General Requirements

- A. The Owner has obtained or will obtain and pay for the permits listed below, which are required for this project. The Contractor shall assist in obtaining certain permits, as indicated. The Contractor shall obtain and pay for all other permits required.

<u>Permits by Owner</u>	<u>Status</u>
MWRA Direct Master (“Direct Connect”) Permit	To be obtained by City
MASS Highway Department Operation & Maintenance Permit	Obtained by City
City of Newton – Street Opening Permit	*
Trench Permit (520 CMR 14.00)	*
*Contractor shall obtain the permit after contract is awarded. Owner will pay for the permit.	

- B. The Contractor shall perform the work in accordance with the Contract Documents, including the attached permits/order of conditions, and any applicable municipal requirements.

END OF SECTION

SECTION 01014

SCOPE AND SEQUENCE OF WORK

1.01 WORK INCLUDED:

- A. This Section of the specifications covers the scope and sequence of work for the Area B Sewer Rehabilitation – Phase 1 in Newton, Massachusetts, including:

The approximate scope of work of the Base Bid includes but is not necessarily limited to: Cleaning and inspection of 17,526 lf of sewers, point repair of 85 lf of sewer, cementitious lining of 3,918 vf of manholes, installation of 47 lf of cured-in-place short liners, 29,794 lf of cured-in-place pipe and reinstatement of 426 service connections, and 94 access port repairs.

The approximate scope of work of Alternate Bid No.1 includes but is not necessarily limited to: Cementitious lining of 622 vf of manholes and 29 access port repairs.

The approximate scope of work of Alternate Bid No.2 includes but is not necessarily limited to: Installation of 5,703 lf of cured-in-place pipe and reinstatement of 90 service connections.

- B. The Contractor shall furnish all labor, materials, equipment, and incidentals required to complete the work as shown on the drawings and as specified herein.

- C. Sewer system rehabilitations include:

1. Chemical root treatment (refer to Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT).
2. Cleaning and inspection of sewer mains to seal joints or circular cracks which are leaking or have the potential to leak (refer to Section 02440, SEWER CLEANING AND INSPECTION).
3. Lining of sewer mains (manhole to manhole) to repair and seal multiple cracks and holes which are leaking or have the potential to leak (refer to Section 02428, CURED-IN-PLACE PIPE).
4. Installing short liners in sewer mains to repair and seal cracks and holes which are leaking or have the potential to leak (refer to Section 02429, CURED-IN-PLACE SHORT LINER).
5. Performing point repair of gravity sewers to repair and seal cracks and holes which are leaking or have the potential to leak (refer to Section 02442, POINT REPAIR OF GRAVITY SEWERS).
6. Rehabilitating service connections including cutting protruding services; television inspecting, pressure testing and grouting to repair and seal cracks and holes which are leaking or have the potential to leak or to seal a reinstated service connection at a liner (refer to Section 02443, SERVICE CONNECTION REHABILITATION).

7. Rehabilitating manholes including invert sealing, exterior sealing and interior coating, install frames and covers, building manhole benches and inverts, and installing sewer manhole complete (refer to Section 02435, SEWER MANHOLE REHABILITATION).
8. Sealing of underdrain access ports, including, redirecting access ports, sealing access ports, sealing caverns and redirecting access ports, and sealing cross connections (refer to Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS).
9. Flow Isolation shall be performed as directed by the Engineer and on all rehabilitated reaches following the completion of construction as described in 02427, FLOW ISOLATION.

1.02 RELATED WORK:

A. SECTION 01110 - CONTROL OF WORK AND MATERIALS

PART 2 – PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall be responsible for scheduling its activities and the activities of any subcontractors involved, to meet the completion date, or milestones, established for the contract. Scheduling of the work shall be coordinated with the Owner and Engineer.
- B. The Construction Sequence Requirements shall be used by the Contractor to form a complete schedule for the project, which shall be coordinated with the Owner and Engineer. Prior to performing any work at the site, the Contractor shall submit a detailed plan in Microsoft Project format to the Engineer for review. The plan shall describe the proposed sequence, methods, and timing of the work.

3.02 SEQUENCE OF WORK:

- A. Root treatment of sewers and manholes shall be conducted first. Any other work in the root treated segments of sewer (manhole to manhole) shall not be performed until a waiting period has passed in accordance with Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.
- B. Seal cavern and redirect access port, redirect access port, seal access port, and seal cross connection shall be completed prior to any other manhole work, except root treatment, and prior to any manhole-to-manhole liner installation or cleaning and inspection of sewers in adjacent line segments.
- C. Cleaning and inspection of sewers, Item 1a, shall be performed during a period of high groundwater, between February 1, 2010 and April 30, 2010.

- D. Cleaning and inspecting shall be performed prior to replacement of sewer pipe (point repair of gravity sewers) and all other trenchless pipeline rehabilitation work in each segment of sewer (manhole-to-manhole), except root treatment and cutting of protruding service connections.
- E. Replacement of sewer pipe (point repair of gravity sewers) shall be performed prior to all other trenchless pipeline rehabilitation work.
- F. Cutting of protruding service connections required in a segment of sewer (manhole to manhole) shall be performed prior to the installation of short liners or cured-in-place liners required in that segment.
- G. Lining (manhole to manhole) and short liners required in a segment of sewer (manhole to manhole) shall be completed prior to any television inspecting, pressure testing, or grouting of service connections required in that segment.
- H. Lining (manhole to manhole) shall be completed prior to any cementitious lining or exterior grouting in adjacent manholes.
- I. All rehabilitated reaches shall be flow isolated after completion of all other construction tasks as described in Section 02427, FLOW ISOLATION.
- J. All work may be scheduled at the Contractor's discretion within the time of contract so long as it adheres to this scope and sequence of work and all plans and specifications. The schedule is also subject to approval by the Engineer.

END OF SECTION

SECTION 01110

CONTROL OF WORK AND MATERIALS

1. Hauling, Handling and Storage of Materials
2. Easements
3. Open Excavations
4. Maintenance of Traffic
5. Care and Protection of Property
6. Protection and Relocation of Existing Structures and Utilities
7. Maintenance of Flow
8. Rejected Materials and Defective Work
9. Sanitary Regulations
10. Safety and Health Regulations
11. Site Investigation
12. Electric Service
13. Hazardous Waste
14. Sewer Service Connections

1. Hauling, Handling and Storage of Materials

- A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

2. Easements

- A. As indicated on the drawings, the work is located in easements obtained by the Owner. The Contractor has no rights outside of the easements unless they are obtained from the property owner.
- B. Contractor shall schedule work so that it will cause minimum inconvenience and nuisance to abutting property owners, over the shortest possible time.

- C. Easements shall be kept clean; no rubbish or discarded construction materials shall be allowed to accumulate. Storage of excess construction materials, including soil, ledge, equipment, or machinery on easements will not be allowed.
- D. Restoration of fences, shrubs, trees and grass shall be completed promptly following completion of the work in an easement, to minimize disruption and inconvenience to property owners.

3. Open Excavations

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.
- B. Bridges provided for access to private property during construction shall be removed when no longer required.
- C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.
- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of steel plates of adequate strength to carry traffic shall be used. Steel plates shall be recessed between November 1st and April 30th.

4. Maintenance of Traffic

- A. Unless permission to close the street is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular and pedestrian traffic may be maintained at all times.
- B. Should the Chief of Police deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall make all arrangements in obtaining uniformed officers required.
- C. The Contractor shall at his own expense, as directed by the Police Traffic Control/Safety Officer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, and animals. He shall provide sufficient temporary lighting such as lanterns/flashers (electric battery operated) or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner.
- D. The Contractor shall furnish all construction signs that are deemed necessary by and in accordance with Part VI of the Manual on Uniform Traffic Control Devices as published by the U.S. Department of Transportation. In addition, the Contractor may be required to furnish up to 128 square feet of additional special construction warning signs. Size and exact wording of signs shall be determined by the Engineer during construction.

- E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as watchmen to protect the Contractor's equipment and materials.
- F. Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property under the terms of the Contract.

5. Care and Protection of Property

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

6. Protection and Relocation of Existing Structures and Utilities

- A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.
- B. The Contractor shall determine the location of all underground structures and utilities (including existing water services, drain lines, electrical lines, and sewers). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by Contractor.
- C. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) promptly restore them in accordance with Section 01564 EXISTING FENCES.
- D. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces.
- E. All property damaged by the Contractor's operations shall be restored to a condition at least equal to that in which it was found immediately before work was begun. Suitable materials and methods shall be used for such restoration.
- F. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.

7. Maintenance of Flow

- A. The Contractor shall at his own cost, provide for the flow of sewers and drains interrupted during the progress of the work, and shall immediately cart away and dispose of all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.
- B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to

impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, he shall repair the same within the same day.

- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by his operations as described in Section 01740, CLEANING UP.

8. Rejected Materials and Defective Work

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

9. Sanitary Regulations

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.

10. Safety and Health Regulations

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et. seq.)." Contractors shall be familiar with the requirements of these regulations.

11. Site Investigation

The Contractor acknowledges that he has satisfied himself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint himself with available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

12. Electric Service

- A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. There shall be sufficient electric lighting so that all work may be done in a workmanlike manner where there is not sufficient daylight.

13. Hazardous Waste

Should the Contractor, while performing work under this contract, uncover hazardous materials, as defined in Massachusetts Hazardous Waste Regulations 310 CMR 30.00, he shall immediately notify the Engineer. The Contractor is not, and has no authority to act as, a handler, generator, operator or disposer of hazardous or toxic substances found or identified at the site, and the Owner shall undertake all such functions.

14. Sewer Service Connections

- A. Contractor shall locate all sewer service connections prior to each segment replacement to expedite reconnection.
- B. The Contractor shall affix a written notice to the door of each home that has sewer service on the segment to be replaced 48-hours prior to disconnection of the service and again the day of disconnection.
- C. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575 HANDLING EXISTING FLOWS and in Section 01535 TEMPORARY BYPASS PUMPING SYSTEM.
- D. Once the new mainline is available for connection, the existing service pipeline shall be removed to at or near the property line and replaced as described in Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.

END OF SECTION

SECTION 01140

SPECIAL PROVISIONS

1. Water for Construction Purposes
2. Pipe Location
3. Dimensions of Existing Structures
4. Occupying Private Property
5. Existing Utility Locations – Contractor’s Responsibility
6. Coordination of Work
7. Time for Completion of Contract
8. Maintenance of Trench Surface
9. Design of Equipment
10. Compliance with Permits
11. Cutting, Fitting and Patching
12. Contractor’s Representative
13. Hours of Construction Activity
14. Construction Crews

1. Water for Construction Purposes

- A. In locations where water is in sufficient supply, the Contractor may be allowed to use water without charge for jetting backfill and other construction purposes. The express approval of the Owner shall be obtained before water is used. Waste of water by the Contractor shall be sufficient cause for withdrawing the privilege of unrestricted use.
- B. The Contractor shall obtain a hydrant meter and backflow preventer from the City prior to using any fire hydrants. A \$1,000 refundable deposit is required.

2. Pipe Location

Pipe shall be located substantially as indicated on drawings. The Owner reserves the right, acting through the Engineer, to make such modifications as may be deemed desirable to avoid interference with existing structures or for other reasons.

3. Dimensions of Existing Structures

Where the dimensions and locations of existing structures are of critical importance in the installation or connections of new work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

4. Occupying Private Property

The Contractor shall not enter upon nor occupy with men, equipment or materials any property outside of the public highways or Owner's easements, except with the written consent of the property owner or property owner's agent.

5. Existing Utility Locations - Contractor's Responsibility

- A. The location of existing underground services and utilities shown on the drawings is based on available records. It is not warranted that all existing utilities and services are shown, nor that shown locations are correct. The Contractor shall be responsible for having the utility companies locate their respective utilities on the ground prior to excavating.
- B. To satisfy the requirements of Massachusetts law, Chapter 82, Section 40, the Contractor shall, at least 72 hours, exclusive of Saturdays, Sundays and holidays, prior to excavation in the proximity of telephone, gas, cable television and electric utilities, notify the utilities concerned by calling "DIG SAFE" at telephone number: 1-888-344-7233 and MWRA Operations Division.
- C. The Contractor shall coordinate all work involving utilities and shall satisfy himself as to the existing conditions of the areas in which he is to perform his work. He shall conduct and arrange his work so as not to impede or interfere with the work of other contractors working in the same or adjacent areas.

6. Coordination of Work

The General Contractor shall be responsible for coordinating his own work as well as that of any subcontractors. He shall be responsible for notification of the Engineer when each phase of work is expected to begin and the approximate completion date.

7. Time for Completion of Contract

The time for completion of this contract is stipulated in the Form of General Bid. The Bidder shall base his bid on completing the proposed work by the completion date stipulated in the Bid Form.

8. Maintenance of Trench Surface

After backfilling and compacting the trench, the Contractor shall be responsible for keeping the ground surface dry and passable at all times until the surface has been restored to original conditions.

9. Design of Equipment

Attention is directed to the fact that the layout of certain equipment is based on that of one manufacturer. If other equipment is submitted for approval, the Contractor shall prepare and submit for approval at his expense, detailed structural, mechanical and electrical drawings, equipment lists, maintenance requirements, and any other data required by the Engineer, showing all necessary changes and embodying all special features of the equipment he proposes to furnish. Such changes, if approved, shall be made at the expense of the Contractor.

10. Compliance with Permits

The Contractor shall perform all work in conformance with requirements of the Permits, which appear in Section 00890 - PERMITS.

11. Cutting, Fitting and Patching

- A. The Contractor shall do all cutting, fitting, or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors, as shown upon or reasonably implied by the drawings and the specifications for the completed structure, including all existing work.
- B. The Contractor shall not endanger any work by cutting, digging, or otherwise and shall not cut or alter the work of any other Contractor, save with the consent of the Engineer.
- C. All holes or openings required to be made in new or existing work, particularly at pipe, conduit, or other penetrations not covered by escutcheons or plates shall be neatly patched. All such holes shall be made completely watertight as approved by the Engineer.
- D. Size and locations of holes required in steel, concrete, or other structural or finish materials for piping, wiring, ducts, etc., which have not been located and detailed on the drawings shall be approved by the Engineer prior to layout and cutting thereof. All holes shall be suitably reinforced as required by the Engineer.
- E. Workmanship and materials of patching and repair work shall match the adjacent similar work and shall conform to the applicable sections of the specification. Patches and joints with existing work shall provide, as applicable in each case, visual, structural, and waterproofing continuity.

12. Contractor's Representative

The Contractor shall designate a representative who will be available to respond to emergency calls by the Owner at any time day and night and on weekends and holidays should such a situation arise.

13. Hours of Construction Activity

- A. The Contractor shall conduct all construction activity between 7:00 a.m. and 4:30 p.m., Monday through Friday. No construction work shall be allowed on Saturdays, Sundays or Holidays without written authorization from the Owner.
- B. The Owner will provide personnel for assistance in locating and operating valves at no cost to the Contractor during the Owner's normal working hours (Monday through Friday 7:00 a.m. to 3:00 p.m.). When this assistance is required by the Contractor outside of the Owner's normal working hours the cost will be incurred by the Contractor at the prevailing overtime rate of pay for the personnel providing the assistance. The Owner will bill the Contractor directly.

14. Construction Crews

The Contractor shall not increase the number of construction crews assigned to the work without providing one week advance notice to the Engineer.

END OF SECTION

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 - DESCRIPTION

1.01 GENERAL:

- A. The following subsections describe the measurement of and payment for the work to be done under the items listed in the Bid Form.
- B. All work performed as described in these contract documents will be paid for under one or more of the items listed in the Bid Form. All other activities required in connection with performance of the work, including all work required under Division 1, GENERAL REQUIREMENTS, whether described in the contract documents or mandated by applicable codes, permits and laws, will not be separately paid for unless specifically provided for in the form of general bid, but will be considered incidental to performance of the overall project.
- C. Each unit or lump-sum price stated in the Bid Form shall constitute full compensation as herein specified for each item of work completed in accordance with the drawings and specifications, including cleanup.
- D. The payment items listed herein and in the Bid Form are intended to provide full payment for the work shown on the drawings and specified herein. Any work called for or implied in the documents but not listed as a payment item shall be considered incidental to the overall project.
- E. Unless otherwise noted, each item shall be furnished and installed in accordance with the technical section whether a specific applicable payment item exists or not.

1.02 CLEANING AND INSPECTION OF SEWERS:

- A. Cleaning and Inspection of Sewers:
 - 1. The work under this item shall be measured at the unit price bid per linear foot cleaned and inspected.
 - 2. Measurement shall be based on the actual length of sewer cleaned and inspected from center line of manhole to center line of manhole. Sewers shall be cleaned and inspected as specified in Section 02440, SEWER CLEANING AND INSPECTION. Verification of adequate cleaning shall be made by television inspection.
 - 3. The television inspection work, DVDs, by-pass pumping, plugging or blocking of sewer flow, and the storage, testing and disposal of any material retrieved from sewer cleaning shall be considered incidental to the work and shall not be considered for payment. All DVDs shall be given to the Owner upon completion of the project.
 - 4. The work under this section shall be paid at the contract unit price under Item 1a.

1.03 POINT REPAIR OF GRAVITY SEWERS:

- A. The length of sewers to be paid for under the appropriate subdivisions of this item shall be measured by the linear foot along the completed sewers, including wyes and tees, of actual sewers installed.
- B. The unit prices under the appropriate subdivisions of this item shall constitute full compensation for constructing the sewers, complete in place, as indicated on the drawings and as specified, including removal and disposal of existing sewers where necessary, furnishing and installing pipe and fittings, making connections to the existing sewer, excavation, backfill, bedding, select material, clearing, grubbing, testing, removal and replacement of sidewalks and curbing and all work incidental thereto and not specifically included for payment under other items, as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS.
- C. The work under this section shall be paid at the contract unit price under Items 2a, 2b, 2c, 2d, and 2e.

1.04 REPLACE 6" SEWER SERVICE:

- A. The per service price shall constitute full compensation for furnishing all labor, materials, tools, and equipment for completing all work related to replacement of a gravity sewer service, including but not limited to television inspection of the remaining length of service connection up to the foundation, bypass pumping, signage, dust control, environmental protection, dewatering, earthwork, paving, pavement striping, curbing, and loaming and seeding.
- B. The sewer service shall be replaced to the property line. The adjacent mainline sewer pipe length shall also be replaced. The mainline sanitary sewer pipe shall be replaced with an 8-inch polyvinyl chloride pipe as described in Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.
- C. The work under this section shall be paid at the contract unit price under Item 3a.

1.05 CHEMICAL ROOT TREATMENT:

A. Sewer Line Chemical Root Treatment:

- 1. Chemical root treatment shall be measured at the unit price bid per linear foot of sewer treated.
- 2. Measurement shall be based on the actual length of treated sewer from center line of manhole to center line of manhole. Sewers shall be chemically treated for root control as specified in Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.
- 3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
- 4. The work under this section shall be paid at the contract unit price under Items 4a.

B. Manhole Chemical Root Treatment:

1. Chemical root treatment shall be measured at the unit price bid per manhole treated.
2. The contract unit price per manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to chemically treat the manholes for root control as specified in Section 02435, SEWER MANHOLE REHABILITATION and Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 4b.

1.06 CURED-IN-PLACE SHORT LINER:

A. General:

1. The work of this item shall be measured at the unit price bid per linear foot of short liner installed.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual length of installed short liners in sewer lines as determined by the Engineer. Short liners shall be installed as specified in Section 02429, CURED-IN-PLACE SHORT LINER.
3. Reinstatement of service connections shall be considered incidental to the work and shall not be measured separately for payment.
4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. Television inspection of sewer lines with short liners shall be considered incidental to the work and shall not be measured separately for payment.
6. The work shall be paid for at the contract unit price under Item 5a.

- B. Ten percent of the payment for the subdivisions of the item “Cured-in-Place Short Liner” shall be withheld until the pipeline rehabilitation’s have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02429, CURED-IN-PLACE SHORT LINER.

1.07 CURED-IN-PLACE STRUCTURAL SHORT LINER:

B. General:

1. The work of this item shall be measured at the unit price bid per linear foot of structural short liner installed.
2. Measurement, including all material, labor, tools and equipment shall be based on the actual length of installed structural short liners in sewer lines as determined by the Engineer. Structural short liners shall be installed as specified in Section 02429, CURED-IN-PLACE SHORT LINER.

3. Reinstatement of service connections shall be considered incidental to the work and shall not be measured separately for payment.
 4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 5. Television inspection of sewer lines with structural short liners shall be considered incidental to the work and shall not be measured separately for payment.
 6. The work shall be paid for at the contract unit price under Item 6a.
- B. Ten percent of the payment for the subdivisions of the item “Cured-in-Place Structural Short Liner” shall be withheld until the pipeline rehabilitation’s have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02429, CURED-IN-PLACE SHORT LINER.

1.08 CURED-IN-PLACE PIPE:

A. General:

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe. Lined pipe shall be measured as the actual length of cured-in-place liner installed and shall be the shortest distance measured from the inside edge of the inversion manhole to the inside edge of the tail manhole.
2. The contract unit price to be paid per linear foot of cured-in-place liner installed shall constitute full compensation for supplying all material, labor, tools, and equipment to install cured-in-place liner as specified in Section 02428, CURED-IN-PLACE PIPE.
3. Cutting of protruding service connections shall be considered incidental to the work and shall not be measured separately for payment.
4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. Television inspection performed prior to the installation of the cured-in-place liner shall be considered incidental to the work and shall not be measured separately for payment.
6. Television inspection of relined sewer pipes shall be considered incidental to the work and shall not be measured separately for payment.
7. The work shall be paid for at the contract unit price under Items 7a, 7b, 19a, and 20a.

B. Reinstatement of Service Connections:

1. The work of this item shall be measured per service connection reinstated, inspected, tested and grouted.
 2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to reinstate service connection, TV inspect and pressure test, and grout the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
 3. The work shall be paid for at the contract unit price under Items 7c and 19b
- C. Ten percent of the payment for the subdivisions of the item “Cured-in-Place Pipe” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.

1.09 CURED-IN-PLACE STRUCTURAL PIPE:

A. General:

1. The work of this item shall be measured at the unit price bid per linear foot of lined pipe. Lined pipe shall be measured as the actual length of cured-in-place structural liner installed and shall be the shortest distance measured from the inside edge of the inversion manhole to the inside edge of the tail manhole.
 2. The contract unit price to be paid per linear foot of cured-in-place structural liner installed shall constitute full compensation for supplying all material, labor, tools, and equipment to install cured-in-place liner as specified in Section 02428, CURED-IN-PLACE PIPE.
 3. Cutting of protruding service connections shall be considered incidental to the work and shall not be measured separately for payment.
 4. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
 5. Television inspection performed prior to the installation of the cured-in-place liner shall be considered incidental to the work and shall not be measured separately for payment.
 6. Television inspection of relined sewer pipes shall be considered incidental to the work and shall not be measured separately for payment.
 7. The work shall be paid for at the contract unit price under Items 8a and 20a.
- B. Ten percent of the payment for the subdivisions of the item “Cured-in-Place Structural Pipe” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02428, CURED-IN-PLACE PIPE.

1.10 SERVICE CONNECTION REHABILITATION:

A. Cutting Protruding Service Connections:

1. The work of this item shall be measured per protruding service connection cut.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to cut the protruding service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. Television inspection of cut service connections shall be considered incidental to the work and shall not be measured separately for payment.
5. Grouting of cut service connections shall be considered incidental to the work and shall not be measured separately for payment.
6. The work shall be paid for at the contract unit price under Item 9a.

B. TV Inspecting and Testing Service Connections:

1. The work of this item shall be measured per service connection TV inspected and pressure tested.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to TV inspect and pressure test the service connection as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work shall be paid for at the contract unit price under Item 9b.

C. Grouting Service Connections after TV inspection:

1. The work of this item shall be measured per service connection grouted.
2. The contract unit price per service to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to grout the service connection if it fails the TV inspection and pressure testing procedure as specified in Section 02443, SERVICE CONNECTION REHABILITATION.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work shall be paid for at the contract unit price under Item 9c.

D. Ten percent of the payment for the subdivisions of the item “Service Connection Rehabilitation” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field

testing/inspection(s) as specified in Section 02443, SERVICE CONNECTION REHABILITATION.

1.11 SEWER MANHOLE REHABILITATION:

A. Cementitious Lining of Manholes:

1. The work of this item shall be measured at the unit price bid per vertical foot of manhole actually lined which will typically be measured from top of manhole bench to bottom of manhole frame.
2. The contract unit price per vertical foot of manhole to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to line the manhole as specified in Section 02435, SEWER MANHOLE REHABILITATION. Cementitious Lining includes invert sealing, exterior chemical sealing, and interior sealing.
3. Bypass pumping and plugging or blocking of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Items 10a and 15a.

B. Furnish and Install Manhole Frames and Covers:

1. The work of this item shall be measured per manhole frame and cover installed.
2. The contract unit price to be paid per manhole frame and cover installed shall constitute full compensation for supplying all material, labor, tools, and equipment required to install the manhole frame and cover as described in Specification Section 02435 SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under Item 10b.

C. Build Manhole Benches and Inverts:

1. The work of this item shall be measured per manhole bench and invert built.
2. The contract unit price to be paid per manhole bench and invert built shall constitute full compensation for supplying all material, labor, tools, and equipment required to build the manhole bench and invert as described in Specification Section 02345, SEWER MANHOLE REHABILITATION.
3. The work under this section shall be paid at the contract unit price under item 10c.

D. Manhole Rehabilitation of B040-6:

1. The lump sum price for this item shall be measured per complete rehabilitation of manhole B040-6.

2. The lump sum price to be paid per rehabilitation of manhole B040-6 shall constitute full compensation for supplying all material, labor, tools, and equipment required to rehabilitate manhole B040-6 as described in Specification Section 02345, SEWER MANHOLE REHABILITATION.

3. The work under this section shall be paid at the contract unit price under item 10d.

E. Install Sewer Manhole Complete:

1. The lump sum price for this item shall be measured per installation of sewer manhole complete.
2. The lump sum price to be paid per installed sewer manhole shall constitute full compensation for supplying all material, labor, tools, and equipment required to install sewer manhole complete as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS, Section 3.04.
3. Replacement of the existing active sanitary service connection with a 6-inch polyvinyl chloride pipe as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS, Section 3.04 shall be considered incidental.
4. The work under this section shall be paid at the contract unit price under item 10e.

F. Ten percent of the payment for the subdivisions of the Items 10a and 15a “Cementitious Lining of Manholes” shall be withheld until the pipeline rehabilitations have satisfactorily completed and passed field testing/inspection(s) as specified in Section 02435, SERVICE CONNECTION REHABILITATION.

1.12 SEALING OF UNDERDRAIN ACCESS PORTS:

A. Seal Cavern and Redirect Access Port:

1. The work of this item shall be measured at the unit price bid per location.
2. The contract unit price per cavern sealed to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to seal caverns and redirect access ports as specified in Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS
3. Bypass pumping and plugging or blocking of sewer and/or underdrain flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 11a.

B. Redirect Access Port:

1. The work of this item shall be measured per access port redirected.
2. The contract unit price per access port to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to redirect the access port from

the manhole invert to the manhole bench as specified in Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS.

3. Bypass pumping and plugging or blocking of sewer and/or underdrain flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 11b and 16a.

C. Seal Access Port:

1. The work of this item shall be measured per access port repaired.
2. The contract unit price per access port sealed to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment to repair and seal the access port as specified in Specifications Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS.
3. Bypass pumping and plugging or blocking of sewer and/or underdrain flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 11c and 16b.

D. Seal Cross Connection:

1. The work of this item shall be measured per cross connection repaired.
2. The contract unit price per access port sealed to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment to repair and seal the access port as specified in Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS.
3. Bypass pumping and plugging or blocking of sewer and/or underdrain flow shall be considered incidental to the work and shall not be measured separately for payment.
4. The work under this section shall be paid at the contract unit price under Item 11d.

- E. Ten percent of the payment for the subdivisions of Item “Sealing of Underdrain Access Ports” shall be withheld until the access point rehabilitations have been satisfactorily completed and passed field testing/inspection(s) as specified in Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS.

1.13 FLOW ISOLATION:

A. Spot Flow Isolation:

1. The work of this item shall be measured at the unit price bid per each spot flow isolation.

2. The contract unit price per spot flow isolation to be paid shall constitute full compensation for supplying all material, labor, tools, and equipment required to perform spot flow isolation as specified in Section 02427, FLOW ISOLATION
3. The work under this section shall be paid at the contract unit price under Item 12a.

B. Post Flow Isolation:

1. The work of this item shall be measured at the unit price per linear foot of sewer flow isolated.
2. Measurement shall be based on the actual length of sewer flow isolated from the centerline of manhole to centerline of manhole. Sewer lines shall be flow isolated as specified in Section 02427, FLOW ISOLATION
3. The contract unit price to be paid per linear foot shall constitute full compensation for supplying all material, labor, tools, and equipment required to perform flow isolation as specified in Section 02427, FLOW ISOLATION
4. Plugging of sewer flow shall be considered incidental to the work and shall not be measured separately for payment.
5. The work under this section shall be paid at the contract unit price under Item 12b and 21a.

1.14 UNIFORMED OFFICERS:

- A. The services of uniformed officers shall be measured per hour worked and paid at the contract unit prices under Items 13a, 17a, and 22a. The unit prices under this item include administration charges required by the police.
- B. The set prices for Uniformed Officers are based on the prevailing hourly wage rates. Payment will be made based on invoices submitted by the traffic authority to the Contractor. The Contractor shall forward copies of these invoices to the Engineer and include the cost in his Application for Payment. Actual payment to the traffic authority shall be made by the Contractor and the Contractor shall be reimbursed by the Owner through the payment estimate. If police wages change during the course of the Contract, the unit prices under this item will be changed accordingly.

1.15 MOBILIZATION:

- A. The lump sum for these items shall constitute full compensation to the Contractor for the general mobilization necessary to make the contract operational, exclusive of the cost of materials.
- B. The total for mobilization for the Base Bid shall not exceed 5 percent of the total of Items 1 to 12. The total for mobilization for Alternate No. 1 shall not exceed 5 percent of the total of Items 15 to 16. The total for mobilization for Alternate No. 2 shall not exceed 5 percent of the total of Items 19 to 21.
- C. The work under this section shall be paid at the contract lump sum price under Items 14a, 18a, and 23a.

1.16 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:

Unless otherwise indicated, protection or temporary removal and replacement of existing utilities and structures as described in Section 01110 shall not be separately measured for payment, but shall be considered incidental to the project.

1.17 DEWATERING

Dewatering shall be considered incidental to the work and shall not be measured separately for payment.

1.18 ENVIRONMENTAL PROTECTION:

Environmental protection shall be considered incidental to the work and shall not be considered separately for payment.

1.19 HANDLING EXISTING FLOWS:

Handling existing sewage flows in accordance with the specifications, including providing, installing, and removing all required equipment, piping, and pumping as required shall not be measured separately for payment, but shall be considered incidental to the project.

1.20 SURFACE RESTORATION:

A. The work for surface restoration shall include loaming and seeding and all incidentals thereto for all disturbed areas. This work shall not be separately measured for payment, but shall be considered incidental to the project.

B. Any existing fences which are required to be removed and reset shall not be separately measured for payment, but shall be considered incidental to the project.

1.21 LOAMING AND SEEING

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.22 LANDSCAPING:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.23 SIGNAGE

The work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.24 DOCUMENTATION:

Television inspection DVDs and hard drives provided to the Owner shall not be separately measured for payment but shall be considered incidental to the project.

1.25 WARRANTY INSPECTION:

All warranty inspections and related work shall not be separately measured for payment but shall be considered incidental to the project.

1.26 SUPPORT OF EXCAVATION:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.27 TRACER TAPE:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.28 FIELD CONCRETE:

Unless otherwise indicated, the work of this section shall not be separately measured for payment, but shall be considered incidental to the project.

1.29 CONSTRUCTION ZONE SAFETY PLAN

The work of this section shall not be measured separately for payment, but shall be considered incidental to the project.

1.30 CONTROLLED DENSITY FILL

The work of this section shall not be measured separately for payment, but shall be considered incidental to the project.

END OF SECTION

SECTION 01330

SUBMITTALS

1. SHOP AND WORKING DRAWINGS

- A. As required by the General Conditions, Contractor shall submit a schedule of shop and working drawing submittals.
- B. In accordance with the accepted schedule, the Contractor shall submit promptly to the Engineer, through its authorized resident representative at the job site, or by mail (if to Weston & Sampson Engineers, attention: CSD), six (6) copies each of shop or working drawings required as noted in the specifications, of equipment, structural details and materials fabricated especially for this Contract.
- C. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish of shop coat, grease fittings, etc., depending on the subject of the drawings. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.
- D. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24-inch by 36-inch sheets, except those which are made by changing existing standard shop or working drawings. All drawings shall be clearly marked with the names of the Owner, Project, Contractor and building, equipment or structure to which the drawing applies, and shall be suitably numbered. Each shipment of drawings shall be accompanied by the Engineer's (if applicable) standard shop drawing transmittal form on which is a list of the drawings, descriptions and numbers and the names mentioned above.
- E. Only drawings which have been prepared, checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Contract Documents in all respects. Shop drawings shall be reviewed and marked with the date, checker's name and indication of the Contractor's approval, and only then shall be submitted to the Engineer. Shop drawings unsatisfactory to the Contractor shall be returned directly to their source for correction, without submittal to the Engineer. Shop drawings submitted to the Engineer without the Contractor's approval stamp and signature will be rejected. Any deviation from the Contract Documents indicated on the shop drawings must be identified on the drawings and in a separate submittal to the Engineer.
- F. The Contractor shall be responsible for the prompt submittal and resubmittal, as necessary, of all shop and working drawings so that there will be no delay in the work due to the absence of such drawings.
- G. The Engineer will review the shop and working drawings as to their general conformance with the design concept of the project and general compliance with the information given in the Contract

Documents. Corrections of comments made on the drawings during the review do not relieve the Contractor from compliance with requirements of the Contract Documents. The Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner. The review of the shop drawings is general and shall not relieve the Contractor of the responsibility for details of design, dimensions, code compliance, etc., necessary for interfacing with other components, proper fitting and construction of the work required by the Contract and for achieving the specified performance. The Engineer will review submittals two times: once upon original submission and a second time if a revision or corrections are required by the Engineer. The Contractor shall reimburse the Owner amounts charged to the Owner by the Engineer for performing any review of a submittal for the third time or greater.

- H. With few exceptions, shop drawings will be reviewed and returned to the Contractor within 30 days of submittal.
- I. No material or equipment shall be purchased or fabricated especially for this Contract nor shall the Contractor proceed with any portion of the work, the design and details of which are dependent upon the design and details of equipment or other features for which review is required, until the required shop and working drawings have been submitted and reviewed by the Engineer as to their general conformance and compliance with the project and its Contract Documents. All materials and work involved in the construction shall then be as represented by said drawings.
- J. Two copies of the shop and working drawings and/or catalog cuts will be returned to the Contractor. The Contractor shall furnish additional copies of such drawings or catalog cuts when he needs more than two copies or when so requested.

2. SAMPLES

- A. Samples specified in individual Sections include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.
- B. The number of samples submitted shall be as specified. Submittal and processing of samples shall follow the procedures outlined for shop and working drawings unless the specifications call for a field submittal or mock-up.
- C. Acceptance of samples will be acknowledged via a copy of the transmittal noting status. When samples are not acceptable, prompt resubmittal will be required.

END OF SECTION

SECTION 01331

DOCUMENTATION

PART 1 – GENERAL

1.01 WORK INCLUDED:

- A. This section covers the requirements for documentation to be furnished by the Contractor on this project.

1.02 RELATED WORK:

- A. Section 02085, POLYVINYLCHLORIDE GRAVITY PIPE AND FITTINGS
- B. Section 02428, CURED-IN-PLACE PIPE
- C. Section 02429, CURED-IN-PLACE SHORT LINER
- D. Section 02440, SEWER CLEANING AND INSPECTION
- E. Section 02435, SEWER MANHOLE REHABILITATION
- F. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT
- G. Section 02442, POINT REPAIR OF GRAVITY SEWERS
- H. Section 02443, SERVICE CONNECTION REHABILITATION
- I. Section 02770, SEALING OF UNDERDRAIN ACCESS PORTS

1.03 DOCUMENTATION:

- A. The Contractor shall maintain printed television inspection logs of sewer segments, for each sewer line segment undergoing repair/rehabilitation under this contract and provide one copy (1) of the logs within five (5) working days of the work being performed. Log sheet format shall be approved by Engineer prior to start of work.
- B. The log sheet(s) as a minimum shall clearly identify:
 - 1. Project Name
 - 2. Street Location, Name, Intersection, Station

3. Date of inspection
 4. Total Length of Line Inspected
 5. Line Size(s)/Joint Spacing/Type
 6. Line and Manhole(s) Condition
 7. Significant observations such as service connections, offset joints, drop joints, broken/cracked pipe, protruding services, roots, collapsed sections, infiltration, presence of scale and corrosion and other discernible features.
 8. Digital Video Disc (DVD) number and filename.
- C. All television inspection shall be recorded in MPEG-1 format and shall include accompanying audio. Inspections shall be recorded one at a time, with each segment recorded as a separate file on the DVD. The contractor shall provide two (2) original and labeled copies of each DVD to the Owner, at no additional cost, as requested by the Engineer during the Project. All DVDs shall have a typed label listing DVD number, date work was performed, Engineer: Weston & Sampson Engineers, Inc., Owner: Newton, MA, Contract: Area B Sewer Rehabilitation – Phase 1, and Contractor name. Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B022-057 to B022-095 Downstream.”
- D. The Contractor shall provide one (1) copy of all logs relative to work performed on sewer manholes within five (5) working days of the work being performed.
- E. The Contractor shall take a digital photograph, in JPEG format, at each manhole before and after manhole rehabilitation. Filenames shall contain sub-area and manhole designations e.g. “B016-062.” Digital photographs shall have a minimum resolution of four (4) megapixels.
- F. The Contractor shall provide Flow Isolation data in Microsoft Excel format.
- G. The Contractor shall also deliver to the Owner, at no additional cost, two (2) external hard drives each including the following information at the end of the project. The external hard drives shall be USB powered and capable of USB 2.0 connectivity and will become the property of the Owner upon delivery. The Contractor shall use file folders to organize individual types of data on the external hard drives. The Contractor shall include the following data on the external hard drive prior to delivery to the Engineer.
- **Sewer Manhole Rehabilitation**
 - Pre and Post Rehabilitation Manhole Inspection Photos in JPEG format
 - Filenames shall contain sub-area and manhole designations e.g. “B016-062”
 - Each manhole rehabilitation log as a separate PDF file
 - Filenames shall contain sub-area and manhole designations e.g. “B016-062”
 - **Underdrain Access Port Rehabilitation**
 - Pre and Post Rehabilitation Underdrain Inspection Photos in JPEG format

- Filenames shall contain sub-area and manhole designations e.g. “B016-062”
 - Each manhole rehabilitation log as a separate PDF file
 - Filenames shall contain sub-area and manhole designations e.g. “B016-062”
- **Flow Isolation**
 - Microsoft Excel file with flow isolation data
 - Field logs as a PDF file
- **Sewer Line and Manhole Chemical Root Treatment**
 - Field logs as a PDF file
- **Sewer Cleaning and Inspection**
 - Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
- **Cured-in-Place Short Liner (and Cured-in-Place Structural Short Liner)**
 - Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
- **Cured-in-Place Pipe – Organized per Inversion**
 - Pre-inversion Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each pre-inversion television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each liner order sheet (describing the material ordered) as a separate PDF file
 - Each service connection reinstatement sign-off sheet as a separate PDF file
 - Each thermo couple log kept during inversion process as a separate PDF file
 - Post-inversion Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each post-inversion television inspection log as a separate PDF file

- Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each material testing results as a separate PDF file
 - **Service Connection Rehabilitation**
 - Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - **Point Repair of Gravity Sewers**
 - Television Inspection MPEG-1 Files
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
 - Each television inspection log as a separate PDF file
 - Filenames shall contain upstream and downstream sub-area and manhole designations as well as camera direction e.g. “B016-063 to B016-062 Downstream”
- H. All PDF versions of all logs included on the external hard drives described above shall also be included on DVDs as an electronic backup. The Contractor shall use file folders to organize the individual types of data as described for the external hard drives. The Contractor shall deliver two (2) copies of each DVD to the Owner, at no additional cost, at the end of the project.

END OF SECTION

SECTION 01535

TEMPORARY BYPASS PUMPING SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section includes furnishing of all materials, labor, equipment, power, and maintenance, to implement a temporary pumping system for the purpose of diverting existing sanitary sewer flows around the work area for the duration of the project.
- B. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor firm who can demonstrate to the Engineer that it has the required expertise in the design and operation of temporary bypass pumping systems. The vendor firm shall provide at least five references of projects similar in size and complexity to this project that have been performed by the firm within the past three years.
- C. The by-pass system shall meet the requirements of all codes and regulatory agencies having jurisdiction

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. The Contractor shall submit a detailed description of the proposed pumping system stamped by a Professional Engineer in the State of Massachusetts and submit it and the vendor's references.
- B. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing sanitary sewer flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these contract documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.
- C. The plan shall include but not be limited to the following:
 - 1. Staging areas for pumps;
 - 2. Flow diversion method and types of materials;
 - 3. Number, size, material, location and method of installation of suction piping;
 - 4. Number, size, material, method of installation and location of discharge piping;
 - 5. Bypass pump sizes, capacity, number of each size to be on site and the related power requirements;

6. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted);
7. Standby power generator size, location;
8. Downstream discharge plan;
9. Method of protecting suction and discharge areas from erosion and damage;
10. Thrust and restraint block sizes and locations;
11. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
12. Method of noise control for each pump and/or generator, with external dB valve.
13. Any temporary pipe supports and anchoring required;
14. Design plans and computation for access to bypass pumping locations indicated on the drawings;
15. Calculations for selection of bypass pumping pipe size;
16. Schedule for installation of and maintenance of bypass pumping lines;
17. Plan indicating proposed location of bypass pumping lines.

PART 2 - MATERIALS

2.01 EQUIPMENT:

- A. All pumps used shall be centrifugal, end suction, fully automatic self-priming units that do not require the use of foot-valves, diaphragm pumps, isolation valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods to accommodate the cyclical nature of bypass flows. The pumps shall not be hydraulic submersible type.
- B. All pumps shall be Godwin Dri-prime Automatic Self-priming Pumps (CD, DPC, or HL Series) as manufactured by Godwin Pumps of America, Inc., (609) 467-3636, (301) 390-3806, or approved equal.
- C. The Contractor shall provide the necessary stop/start controls for each pump.
- D. The Contractor shall include one stand-by pump system (including suction and discharge piping) of each size to be maintained on site.
- E. Additional back-up pumps shall be on-line, isolated from the primary system by a valve.

- F. Discharge Piping - in order to prevent the accidental spillage of flows, all temporary discharge systems shall be constructed of rigid pipe with positive, restrained joints. Under no circumstances will aluminum "Irrigation" type piping or glued PVC pipe be allowed. Discharge hoses will only be allowed in short sections and with the specific permission of the Engineer.
- G. Allowable piping materials will be Godwin "QD" steel pipe (Godwin Pumps of America, Inc.), or fused, high-density polyethylene pipe as manufactured by Phillips Driscopipe, Inc., or approved equal.

2.02 SYSTEM DESCRIPTION:

A. DESIGN REQUIREMENTS:

1. The Contractor shall provide all pipeline, plugs, pumps of adequate size to handle peak flow, and discharge piping to ensure that the total flow can be safely diverted around the area of work. Bypass pumping system will be required to operate 24 hours per day.
2. The Contractor shall have adequate standby power and pumping equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.
3. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performance of work.
4. The Contractor shall provide on-site monitoring of the bypass system 24-hours per day during the operation.

B. PERFORMANCE REQUIREMENTS:

1. It is essential for the protection of the public safety and private property that there be no interruption in the flow throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the flow before it reaches the point where it would interfere with his work, carry it past his work and return it to the existing piping system downstream of his work.
2. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the flow past the work area. The Contractor will not be permitted to stop or impede the flows under any circumstances.
4. The Contractor shall maintain flow around the work area in a manner that will not cause surcharging or significant level variations in the existing piping system, and that will protect public and private property from damage and flooding.

5. The Contractor shall protect water resources, wetlands and other natural resources.
6. The Contractor shall be responsible to meet noise requirements (73dbA @ 30'). All diesel driven primary and standby pumps shall be sound attenuated. The use of Critical Silenced Canopy Pumps or acoustical Whisper Pac enclosures for sound attenuation are required.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL AND MAINTENANCE.

- A. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. The Engineer shall be given 24 hours notice prior to testing.
- B. Contractor shall inspect bypass pumping system every two hours to ensure that the system is working correctly.
- C. The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.
- D. Spare parts for pumps and piping shall be kept on site as required.
- E. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

3.02 PRECAUTIONS:

- A. Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his by pass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
- B. During all bypass pumping operation, the Contractor shall protect the work area and all local utilities from damage inflicted by any equipment. The Contractor shall be responsible for all physical damage to public and private property caused by human or mechanical failure.

3.03 INSTALLATION AND REMOVAL:

- A. The Contractor shall construct temporary bypass pumping structures only at the access locations indicated on the drawings and may be required to provide adequate suction conduit.
- B. Diverting or blocking of sanitary sewer flow shall incorporate primary and secondary devices. When diversion or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. The Contractor shall exercise caution and comply with OSHA requirements when working in the presence of gases, combustible or oxygen-deficient atmospheres, and confined spaces.

- D. Except as specifically permitted, the installation of the bypass pipelines is prohibited in all saltmarsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals from the Owner for placement of the temporary pipeline within public ways.

END OF SECTION

SECTION 01550

SIGNAGE (TRAFFIC CONTROL)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing and installing traffic control signs and other devices.

1.02 SYSTEM DESCRIPTION:

The Contractor shall furnish and install all construction signs deemed necessary by and in accordance with the latest edition of Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) as published by the U.S. Department of Transportation.

PART 2 - PRODUCTS

2.01 TRAFFIC WARNING AND REGULATING DEVICES:

Contractor shall provide warning signs, barricades and other devices in accordance with the specifications provided in the MUTCD. Size of signs, lettering, colors, method of support and other factors prescribed in the MUTCD shall be adhered to.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Contractor shall erect barricades, barrier fences, traffic signs, and other traffic control devices as required by the MUTCD, or as directed by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses.
- C. Unless extended protection is required for specific areas, when the work has been completed, all temporary warning and regulatory devices used by the Contractor shall be removed so that traffic can move unimpeded through the area.

END OF SECTION

SECTION 01552

CONSTRUCTION ZONE SAFETY PLAN

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the provisions for complying with Commonwealth of Massachusetts requirements for construction zone safety plans on public works projects.

1.02 DESCRIPTION:

- A. The Contractor shall implement traffic safety and control measures through the construction zone through road closures and detours and mitigate impacts on traffic outside of the construction zone in accordance with these contract documents.

1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01553, UNIFORMED OFFICERS FOR TRAFFIC CONTROL

1.04 REFERENCES:

701 CMR 7.00 Use of Road Flaggers and Police Details on Public Works Projects

Massachusetts Highway Department Standard specifications for Highways and Bridges

– latest edition

PART 2 - PRODUCTS

- 2.01 Traffic control devices utilized by the Contractor shall meet the requirements of these contract documents and the MHD Specifications.

PART 3 - EXECUTION

3.01 OPERATION:

- A. Contractor shall provide barricades, barrier fences, traffic signs, and other traffic control devices in accordance with typical traffic management plans and details shown on the drawings. The Engineer has provided typical plans for work in roadways and at intersections. The Contractor shall provide specific plans for review for work requiring any traffic management plan that deviates significantly from the typical plans shown on the drawings.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as directed by the Owners Traffic Control Officer or the Engineer.

- C. Police details shall be used as required for a safe work site as determined by the local police department.
- D. Should police details fail to show up for work at the construction zone at the usual time for start of work, or otherwise leave the jobsite before work is completed for the day, the provisions of the Alternative Plan will be followed by the Contractor.

3.02 ALTERNATIVE PLAN:

- A. In accordance with 701 CMR 7.06(6), whenever required police details do not arrive on time or fail to show up for work, the Alternative Plan will be implemented by the Contractor.
- B. The Alternative Plan for this project is as follows:
 - 1. Redeploy construction crew(s) to areas where police details are not required.

END OF SECTION

SECTION 01553

UNIFORMED OFFICERS FOR TRAFFIC CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the provisions for furnishing Uniformed Officers for Traffic Control and Maintenance of Traffic as described in Section 01110 CONTROL OF WORK AND MATERIALS.

1.02 DESCRIPTION:

- A. The Contractor shall coordinate with the local jurisdictions Traffic Control Officer to determine the number of Officers deemed necessary to provide for public safety and to maintain a smooth flow of traffic through the construction area(s) effected.

1.03 RELATED WORK:

- A. SECTION 01110, CONTROL OF WORK AND MATERIALS
- B. SECTION 01550, SIGNAGE (TRAFFIC CONTROL)
- C. SECTION 01552, CONSTRUCTION ZONE SAFETY PLAN

PART 2 - PRODUCTS

2.01 UNIFORMED OFFICERS:

- A. Contractor shall provide the Traffic Control Officer with a minimum of 24 hours notice indicating the time of day, street location and confirm number of officers required for traffic control.
- B. Contractor shall give the Traffic Control Officer a minimum of 2 hours prior cancellation notice should Contractor determine that due to weather or conditions beyond his control he would not need the scheduled officers.
- C. Contractor shall pay for officer(s) at the prevailing rate established by the local police department should officers not be needed and the Contractor fails to cancel the officers as noted in 2.01.B above.
- D. Where the Owner is paying directly for Traffic Officers and the Contractor cancels scheduled officers, the Contractor shall be responsible for payment of the wages for cancellations if not cancelled in accordance with 2.01.B and 2.01.C above.

PART 3 - EXECUTION

3.01 OPERATION:

- A. Contractor shall provide barricades, barrier fences, traffic signs, and other traffic control devices as required by the Owners Traffic Control Officer, or as directed by the Engineer, to protect the work area from traffic, pedestrians, and animals.
- B. Contractor shall relocate barricades, signs and other devices as necessary as the work progresses as directed by the Owners Traffic Control Officer or the Engineer.

END OF SECTION

SECTION 01562

DUST CONTROL

1. Description

This section of the specification covers the control of dust via calcium chloride and water, complete.

2. Calcium Chloride

- A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.
- B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment, may be rejected by the Engineer.

3. Water

Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

4. Application

- A. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 01570, ENVIRONMENTAL PROTECTION.
- B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as directed by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.
- D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

END OF SECTION

SECTION 01564

EXISTING FENCES

1. Description

- A. This section of the specification covers the removal and resetting of existing fences.

2. General

- A. Where the removal of existing fences, at locations shown on the plans and where directed by the Engineer, is required, the Contractor shall remove and reset such fences as directed by the Engineer.
- B. The materials removed shall be utilized to reset the fence. Where necessary, new posts and bases shall be furnished and installed by the Contractor. Any materials damaged or lost during or subsequent to removal shall be replaced by the Contractor without additional compensation.
- C. All new materials required shall be equal in quality and design to the materials in the present fences.

3. Removal of Existing Fences

The present fences shall be carefully removed together with all appurtenances and satisfactorily stored and protected until required for resetting.

4. Erection

- A. Fences shall be reset plumb and to the grades required and shall conform to the original fence or as the Engineer directs. Backfilling around the posts shall consist of suitable material satisfactorily compacted. If the fence posts were originally set in concrete bases they shall be reset in concrete bases.
- B. Painting, if required, shall be done as directed by the Engineer.

END OF SECTION

SECTION 01570
ENVIRONMENTAL PROTECTION

1. Description
2. Notification
3. Implementation
4. Area of Construction Activity
5. Protection of Water Resources
6. Construction in Areas Designated as Wetlands on the Drawings
7. Protecting and Minimizing Exposed Areas
8. Location of Storage Areas
9. Protection of Landscape
10. Discharge of Dewatering Operations
11. Silt Fence
12. Dust Control
13. Separation and Replacement of Topsoil
14. Baled Hay or Straw

1. Description

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to cross-country areas, river and stream crossings, and construction in and adjacent to wetlands, unless otherwise specifically stated.

2. Notification

The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Engineer may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

3. Implementation

- A. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.
- B. The Contractor shall submit for approval six sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities within 100 feet of wetlands or across areas designated as wetlands.

4. Area of Construction Activity

Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

5. Protection of Water Resources

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.

6. Construction in Areas Designated as Wetlands on the Drawings

- A. Insofar as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands. Total easement widths shall be limited to the widths shown.
- B. The Contractor shall perform his work in such a way that these areas are left in the condition existing prior to construction.
- C. The elevations of areas designated as wetlands shall not be unduly disturbed by the Contractor's operations outside of the trench limits. If such disturbance does occur, the Contractor shall take all measures necessary to return these areas to the elevations which existed prior to construction.
- D. In areas designated as wetlands, the Contractor shall carefully remove and stockpile the top 24 inches of soil. This topsoil material shall be used as backfill for the trench excavation top layer. The elevation of the trench shall be restored to the preconstruction elevations wherever disturbed by the Contractor's operation.
- E. The Contractor shall use a trench box, sheeting or bracing to support the excavation in areas designated as wetlands.
- F. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as directed by the Engineer.
- G. The use of a temporary gravel roadway to construct the pipeline in the wetlands area is not acceptable. The Contractor will be required to utilize timber or rubber matting to support his equipment in these areas. The timber or rubber matting shall be constructed in such a way that it is capable of supporting all equipment necessary to install the pipeline. The timber or rubber matting shall be constructed of materials and placed in such a way that when removed the material below the matting will not be unduly disturbed, mixed or compacted so as to adversely affect recovery of the existing plant life.
- H. Bentonite dams shall be placed in wetlands to prevent drainage. Locations for dams are as indicated on the drawings or as directed by the Engineer.

- I. During construction, easements within wetlands shall be lined with a continuous haybale/siltation fence barrier.

7. Protecting and Minimizing Exposed Areas

- A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.
- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

8. Location of Storage Areas

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of baled hay or straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.
- C. There shall be no storage of equipment or materials in areas designated as wetlands.
- D. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.
- E. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

9. Protection of Landscape

- A. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the Owner. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.
- B. Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- C. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the

Engineer may direct the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 02230, CLEARING AND GRUBBING.

- D. Cultivated hedges, shrubs, and plants which could be injured by the Contractor's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

10. Discharge of Dewatering Operations

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands. When constructing in a wetlands area, the Contractor shall discharge water from dewatering operations directly to the nearest drainage system, stream, or waterway after filtering by an approved method.
- C. The pumped water shall be filtered through baled hay, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

11. Silt Fence

- A. Where indicated on the drawings or where directed by the Engineer, the Contractor shall erect and maintain a temporary silt fence. In areas designated as wetlands, the Contractor shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.
- B. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 22-foot wide, continuous length support netting, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1½-inches by 1½-inches (Minimum Dimension) by 48 inches and shall be tapered. The support netting shall be industrial strength polypropylene. The bottom edge of the sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall conform to the following properties:

Property	Value	Test Method
1. Grab Strength (lbs.)	124	ASTM D-4632
2. Elongation (%)	15%	ASTM D-4632

3. Puncture Strength (lbs.)	65	ASTM D-4833
4. Burst Strength (psi)	300	ASTM D-3786
5. Trapezoid Tear (lbs.)	60	ASTM D-4533
6. Equivalent Opening Size (U.S. Sieve)	No. 30	ASTM D-4571
7. Permittivity (sec ⁻¹)	0.10	ASTM D-4491
8. Water Flow Rate (gal/min/sf.)	10	ASTM D-4491
9. UV Resistance (%)	70	ASTM D-4355

C. The silt fence shall be Mirafi Envirofence manufactured by Mirafi, Inc. or approved equal.

12. Dust Control

A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the Engineer decides it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 01562, DUST CONTROL.

B. Calcium Chloride shall not be used for dust control within a drainage basin or in the vicinity of any source of potable water.

13. Separation and Replacement of Topsoil

Topsoil shall be carefully removed from cross-country areas where excavations are to be made, and separately stored to be used again as directed. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

14. Baled Hay or Straw

To trap sediment and to prevent sediment from clogging drainage systems, baled hay or straw shall be used where shown on the drawings. Care shall be taken to keep the bales from breaking apart. The bales should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically. Hay bales shall not be placed within a waterway during construction of the pipeline crossing.

END OF SECTION

SECTION 01575

HANDLING EXISTING FLOWS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to handle existing sanitary and combined sewage flows and installation and maintenance of all temporary connections, plugs, and by-pass pumping.

1.02 RELATED WORK:

Section 01330 - SUBMITTALS

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of complete, checked shop drawings, showing equipment, method of by-passing, and the method of transferring flows from the existing system to the new system.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.01 MAINTAINING EXISTING FLOWS:

- A. The Contractor shall maintain all flows in the existing system until construction or rehabilitation is complete and ready for safe operation.
- B. The Contractor shall protect against surcharging of the existing system upstream of the work area by installing adequate temporary by-pass pumping to handle dry weather and wet weather flows.
- C. The Contractor shall repair any damage that occurs to existing pipes and structures to the satisfaction of the Engineer. Work performed under this section shall be considered incidental and shall not be measured separately for payment.
- D. The contractor shall not allow sanitary flow to discharge to any salt or fresh water body by means of overflow, by-pass pumping, or any other method that may contaminate these water areas.

END OF SECTION

SECTION 01740

CLEANING UP

PART 1 - GENERAL

1.01 DESCRIPTION:

The Contractor must employ at all times during the progress of his work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The Contractor shall immediately, upon direction by the Engineer provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the Engineer.

1.02 RELATED WORK:

- A. Section 01110 CONTROL OF WORK AND MATERIALS
- B. Section 01140 SPECIAL PROVISIONS
- C. Section 01570 ENVIRONMENTAL PROTECTION

PART 2 – PRODUCTS

Not applicable

PART 3 – EXECUTION:

3.01 DAILY CLEANUP:

- A. The Contractor shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.
- B. Upon written notification by the Engineer, the Contractor shall within 24 hours clean up those areas, which in the Engineer's opinion are in violation of this section and the above referenced sections of the specifications.
- C. If in the opinion of the Engineer, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

3.02 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

- A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and

satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.03 REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

- A. On or before completion of the work, the Contractor shall, unless otherwise specifically directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; shall remove silt fences and hay bales used for trapping sediment; and shall leave the roads and all parts of the property and adjacent property affected by his operations in a neat and satisfactory condition.

3.04 RESTORATION OF DAMAGED PROPERTY:

- A. The Contractor shall restore or replace, when and as directed, any property damaged by his work, equipment or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk and landscaping work. Materials, equipment, and methods for such restoration shall be as approved by the Engineer.

3.05 FINAL CLEANUP:

- A. Before acceptance by the Owner, the Contractor shall perform a final cleanup to bring the construction site to its original or specified condition. This cleanup shall include removing all trash and debris off of the premises. Before acceptance, the Engineer shall approve the condition of the site.

END OF SECTION

SECTION 02058

CONTROLLED DENSITY FILL (CDF)

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. Controlled Density Fill (CDF) material is a flowable, self consolidating, rigid setting, low density material that can be substituted for compacted gravel for backfills, fills and structural fills.
- B. There are two main categories of Controlled Density Fill; excavatable and non-excavatable, with a subcategory of flowable and very flowable.
- C. Controlled Density Fill is to be used where indicated on the contract drawings or as described in the specifications.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01270, MEASUREMENT AND PAYMENT
- D. Section 01330, SUBMITTALS
- E. Section 02300, EARTHWORK
- F. Section 02252, SUPPORT OF EXCAVATION
- G. Section 02745, PAVING

1.03 REFERENCES:

Commonwealth of Massachusetts Highway Department (MHD) Standard Specification for Highways and Bridges - Subsection M4.08.0, CONTROLLED DENSITY FILL.

1.04 SUBMITTALS:

Proposed Mix Designs for the type(s) of Controlled Density Fill shall be submitted for review and approval from the Contractor's Ready Mix provider in accordance with Section 01330.

PART 2 - PRODUCTS

2.01 MATERIALS:

Materials employed in the Controlled Density Fill shall meet the requirements as described in MHD Standard Specifications Subsection M4.08.0.

2.02 TYPE OF CONTROLLED DENSITY FILL:

Controlled Density Fill for this project shall be fast curing Type 1E – Very Flowable (Excavatable), as described in MHD Subsection M4.08.0.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Controlled Density Fill shall be batched at a ready mix plant and is to be used at a high or very high slump of approximately 10- to 12-inches. It shall be flowable, require no vibration and after it has been placed for Type 1E and 2E, be excavatable by hand tools and/or small machines.
- B. Controlled Density Fill shall be placed so as to not disturb adjacent structures, utilities or the sidewalls of trenches.
- C. Controlled Density Fill shall be installed as described in the specifications and shall be kept below the top of the trench to allow for the placement of the required depth of pavement as specified in these documents or as indicated in the contract drawings.
- D. The Controlled Density Fill shall be protected by steel road plates until the fill reaches a point that it will not be deformed by traffic passing over it.

END OF SECTION

SECTION 02085

POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS (SDR-35)

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers the furnishing and installation of Polyvinyl Chloride (PVC) pipe and fittings, as indicated on the drawings and as specified herein.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02252, SUPPORT OF EXCAVATION
- C. Section 02518, TRACER TAPE
- D. Section 02631, PRECAST MANHOLES

1.03 REFERENCES:

- A. The following standards form a part of these specifications as referenced:

American Society for Testing and Materials (ASTM)

ASTM	D2321	Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
ASTM	D3034	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM	D3212	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM	F679	Specification for Polyvinyl Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings (18" - 27")

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of manufacturer's literature of the materials of this section shall be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. PVC nonpressure sewer pipe 4-inches through 15-inches diameter shall conform to ASTM D3034, 18-inches through 27-inches diameter to ASTM F679, all with SDR of 35 unless noted, and shall meet the specific requirements and exceptions to the aforementioned specifications that follow.
- B. PVC nonpressure sewer pipe shall be furnished in standard lengths.
- C. One pipe bell consisting of an integral wall section with a solid cross section rubber ring, factory assembled, shall be furnished with each standard, random and short length of pipe. Rubber rings shall be provided to the requirements of ASTM D3212.
- D. The rubber ring shall be retained within the bell of the pipe by a precision formed groove or recess designed to resist fishmouthing or creeping during assembly of joints.
- E. Spigot pipe ends shall be supplied with bevels from the manufacturer to ensure proper insertion. Each spigot end shall have an "assembly stripe" imprinted thereon to which the bell end of the mated pipe will extend upon proper jointing of the two pipes.
- F. PVC fittings shall be provided with bell and/or spigot configurations with rubber gasketed joints compatible with that of the pipe. Bend fittings with spigot ends shorter than the pipe recess bells will not be allowed. The shorter spigot end would not allow proper seating of the spigot in the mating bell and would permit undesired contact between the mating bell and the outside of the fitting bell.
- G. All pipe delivered to the job site shall be accompanied by independent testing laboratory reports certifying that the pipe and fittings conform to the above-mentioned specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such of the tests specified as he may from time to time deem necessary.
- H. All cutting of pipe shall be done with a machine suitable for cutting PVC pipe. Cut ends shall be beveled when recommended by the pipe manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Except as modified herein, installation of the PVC pipe shall be in accordance with ASTM D2321.
- B. Each pipe length shall be inspected before being laid to verify that it is not cracked. Pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.
- C. The pipe shall be supported by compacted crushed stone. Crushed stone shall be as specified under Section 02300, EARTHWORK.
- D. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. When each pipe has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- E. Before a joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that inverts are matched and conform to the required line and grade.
- F. For pipe placed on crushed stone, immediately after the joint is made, the jointing area shall be filled with suitable materials so placed and compacted that the ends of either pipe will not settle under backfill load.
- G. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
- H. Branches and fittings shall be laid by the Contractor as indicated on the drawings, and/or as directed by the Engineer. Open ends of pipe and branches shall be closed with PVC caps secured in place with premolded gasket joints or as directed by the Engineer.
- I. All pipe joints shall be made as nearly watertight as practicable. There shall be no visible leakage at the joints and there shall be no sand, silt, clay, or soil of any description entering the pipeline at the joints. Where there is evidence of water or soil entering the pipeline, connecting pipes, or structures, the defects shall be repaired to the satisfaction of the Engineer.
- J. The Contractor shall build a tight bulkhead in the pipeline where new work enters an existing sewer. This bulkhead shall remain in place until the Engineer authorizes its removal.
- K. Care shall be taken to prevent earth, water, and other materials from entering the pipe, and when pipe laying operations are suspended, the Contractor shall maintain a suitable stopper in the end of the pipe and also at openings for manholes.
- L. As soon as possible after the pipe and manholes are completed on any street, the Contractor shall flush out the new pipeline using a rubber ball ahead of the water, and none of the flushing water or debris shall be permitted to enter any existing sewer.

3.02 QUALITY ASSURANCE

A. TELEVISION INSPECTION:

1. On completion of a section of sewer, including building connections installed to the property line, the Contractor shall TV inspect the section in accordance with Section 02440, SEWER CLEANING AND INSPECTION, at no additional cost to the Owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the sewer.
3. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
4. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

END OF SECTION

SECTION 02089

DUCTILE IRON GRAVITY PIPE AND FITTINGS FOR SEWERS AND UNDERDRAINS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers the furnishing, handling, hauling, laying, jointing, and testing of ductile iron pipe used for gravity sewer and underdrain construction, including fittings and appurtenant work as indicated on the drawings and as specified.

1.02 RELATED WORK:

- A. Section 02252, SUPPORT OF EXCAVATION
- B. Section 02300, EARTHWORK
- C. Section 02631, PRECAST MANHOLES

1.03 QUALITY ASSURANCE

- A. All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. The Contractor shall furnish in duplicate to the Engineer sworn certificates of such tests.
- B. In addition, the Owner reserves the right to have any or all pipe, fittings and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Owner's expense.

1.04 REFERENCES:

- A. The following standards form a part of these specifications as referenced:

American Water Works Association

AWWA	C104	Cement-Mortar Lining for Ductile- Iron Pipe and Fittings for Water Flexible Elastomeric Seals
AWWA	C110	Ductile-Iron and Gray-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids
AWWA	C111	Rubber Gasket Joints for Ductile- Iron and Gray-Iron Pressure Pipe and Fittings
AWWA	C150	Thickness Design of Ductile-Iron Pipe
AWWA	C116	Protective Fusion Bonded Epoxy Coatings for the Interior and

Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings

AWWA C151 Ductile-Iron Pipe, Centrifugally Cast for Water or Other Liquids

AWWA C153 Ductile-Iron Compact Fittings, 3 inches through 64 inches for Water Service.

AWWA C600 Installation of Ductile-Iron Water Mains

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of manufacturer's literature of the materials of this section shall be submitted to the Engineer for review.
- B. Shop drawings shall consist of manufacturer's scale drawings, cuts or catalogs including descriptive literature and complete characteristics and specifications, and code requirements. Shop drawings shall be submitted for the ductile iron pipe, type of joint, fittings, couplings, filling rings, and lining and coating in accordance with specifications.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. The Contractor shall use push-on joint type ductile iron pipe unless otherwise indicated on the plans or specified herein.
- B. All ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151.
- C. Unless otherwise indicated or specified, ductile iron pipe shall be Thickness Class 52.
- D. All pipe delivered to the job site shall be accompanied by independent testing laboratory reports certifying that the pipe and fittings conform to the above-mentioned specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such of the tests specified, as he may from time to time deem necessary.
- E. All cutting of pipe shall be done with a machine suitable for cutting DI pipe. Cut ends shall be beveled when recommended by the pipe manufacturer.

2.02 FITTINGS:

- A. Fittings shall conform to the requirements of AWWA C110 or C153 as appropriate and shall be of a pressure classification at least equal to that of the pipe with which they are used.
- B. The Contractor shall use ductile iron fittings. Cast-iron, Class 250 fittings may be substituted, upon approval of the Engineer, for ductile iron fittings.
- C. Unless otherwise indicated, fittings shall have all bell mechanical joint ends.

2.03 GASKETS, GLANDS, NUTS AND BOLTS:

- A. Gaskets, glands, nuts, bolts and accessories shall conform to AWWA C111 or C153 as appropriate.
- B. Gaskets shall be of plain tipped rubber, suitable for exposure to the liquid within the pipe.
- C. Glands shall be ductile or cast iron.
- D. Bolts and nuts shall be high strength alloy.

2.04 LINING AND COATING:

- A. The inside of pipe and fittings shall be given a cement lining and asphaltic seal coat in accordance with AWWA C104. The thickness of the lining shall be double that specified in AWWA C104.
- B. The outside of pipe and fittings shall be coated with the standard asphaltic coating specified under the appropriate AWWA Standard Specification for pipe and fittings.
- C. Machined surfaces shall be cleaned and coated with a suitable rust preventative coating at the shop immediately after being machined.

2.05 FLEXIBLE COUPLINGS:

- A. All sleeve-type couplings and accessories shall be of a pressure rating at least equal to that of the pipeline in which they are to be installed.
- B. Couplings shall be cast or ductile iron and shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
- C. Couplings for buried pipe shall be Dresser 153; Smith-Blair Type 441 or 443; Romac Style 501; Ford Style FC1 or FC2; or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION BEFORE INSTALLATION:

Pipes and fittings shall be subjected to a careful inspection just before being laid or installed.

3.02 HANDLING AND CUTTING:

- A. Any pipe or fitting which has a damaged lining, scratched or marred machine surface and/or abrasion of the pipe coating or lining shall be rejected and removed from the job-site.
- B. Any fitting showing a crack and any fitting or pipe which has received a severe blow that may have caused incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work.
- C. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used will be perfectly sound. The cut shall be made in the sound barrel at a point at least 12 inches from the visible limits of the crack.

- D. Except as otherwise approved, all cutting shall be done with a machine suitable for cutting ductile iron pipe. Hydraulic squeeze cutters are not acceptable for cutting ductile iron pipe. Travel type cutters or rotary type abrasive saws may be used. All cut ends shall be examined for possible cracks caused by cutting.
- E. Lined and coated pipe and fittings shall be assembled and installed with approved packing or gaskets of the type recommended by the pipe manufacturer for the particular lining used.

3.03 INSTALLATION:

- A. Each pipe length shall be inspected before being laid to verify that it is not cracked. Pipe shall be laid to conform to the lines and grades indicated on the drawings or given by the Engineer. Each pipe shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.
- B. The pipe shall be supported by compacted crushed stone. Crushed stone shall be as specified under Section 02300, EARTHWORK.
- C. The pipe shall not be driven down to grade by striking it with a shovel handle, timber, rammer, or other unyielding object. When each pipe has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- D. Before a joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that inverts are matched and conform to the required line and grade.
- E. For pipe placed on crushed stone, immediately after the joint is made, the jointing area shall be filled with suitable materials so placed and compacted that the ends of either pipe will not settle under backfill load.
- F. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
- G. Branches and fittings shall be laid by the Contractor as indicated on the drawings, and/or as directed by the Engineer. Open ends of pipe and branches shall be closed with DI caps secured in place with premolded gasket joints or as directed by the Engineer.
- H. All pipe joints shall be made as nearly watertight as practicable. There shall be no visible leakage at the joints and there shall be no sand, silt, clay, or soil of any description entering the pipeline at the joints. Where there is evidence of water or soil entering the pipeline, connecting pipes, or structures, the defects shall be repaired to the satisfaction of the Engineer.
- I. The Contractor shall build a tight bulkhead in the pipeline where new work enters an existing sewer. This bulkhead shall remain in place until its removal is authorized by the Engineer.
- J. Care shall be taken to prevent earth, water, and other materials from entering the pipe, and when pipe-laying operations are suspended, the Contractor shall maintain a suitable stopper in the end of the pipe and at openings for manholes.

- K. As soon as possible after the pipe and manholes are completed on any street, the Contractor shall flush out the new pipeline using a rubber ball ahead of the water, and none of the flushing water or debris shall be permitted to enter any existing sewer.

3.04 PUSH ON JOINTS:

- A. Joining of push-on joint pipe shall conform to AWWA C600.
- B. If effective sealing of the joint is not attained, the joint shall be disassembled, thoroughly cleaned, a new gasket inserted and joint reassembled.

3.05 MECHANICAL JOINTS:

- A. Assembling of fittings with mechanical joint ends shall conform to AWWA C600.
- B. If effective sealing of the joint is not attained at the maximum torque indicated in the above standard, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be overstressed to tighten a leaking joint.

3.06 SLEEVE-TYPE COUPLINGS:

- A. Pipe ends shall be cleaned thoroughly prior to installation. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferable by use of a torque wrench of the appropriate size and torque for the bolts. The correct torque as indicated by a torque wrench shall not exceed 90 foot-lb.

3.07 QUALITY ASSURANCE

- A. On completion of a section of sewer, including building connections installed to the property line, the Contractor shall TV inspect the section in accordance with Section 02440, SEWER CLEANING AND INSPECTION at no additional cost to the Owner.
- B. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the sewer. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
- C. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. The Contractor shall do all required clearing and grubbing as indicated on the drawings or herein specified in the area required for construction operations on the Owner's land or in the Owner's permanent or temporary easements and shall remove all debris resulting there from.
- B. Unless otherwise noted, all areas to be cleared shall also be grubbed.
- C. The Contractor shall not clear and grub outside of the area required for construction operations.

1.02 RELATED WORK:

Any trees and shrubs specifically designated by the Owner not to be cut, removed, destroyed, or trimmed shall be saved from harm and injury in accordance with Section 01570, ENVIRONMENTAL PROTECTION.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 RIGHT TO WOOD AND LOGS:

The Owner shall have the right to cut and remove logs and other wood of value in advance of the Contractor's operations. All remaining logs and other wood to be removed in the course of clearing shall become the property of the Contractor

3.02 CLEARING:

- A. Unless otherwise indicated, the Contractor shall cut or otherwise remove all trees, saplings, brush and vines, windfalls, logs and trees lying on the ground, dead trees and stubs more than 1-foot high above the ground surface (but not their stumps), trees which have been partially uprooted by natural or other causes (including their stumps), and other vegetable matter such as shags, sawdust, bark, refuse, and similar materials.
- B. The Contractor shall not remove mature trees (4 inches or greater DBH) in the Owner's temporary easements.
- C. Except where clearing is done by uprooting with machinery or where stumps are left longer to facilitate subsequent grubbing operations, trees, stumps, and stubs to be cleared shall be cut as close to the ground as practicable but not more than 6-inches above the ground surface in the case of small trees, and 12-inches in the case of large trees. Saplings, brush and vines shall be cut close to the ground.

3.03 GRUBBING:

- A. Unless otherwise indicated, the Contractor shall completely remove all stumps and roots to a depth of 18-inches, or if the Contractor elects to grind the stumps, they shall be ground to a minimum depth of 6-inches.
- B. Any depression remaining from the removal of a stump and not filled in by backfilling shall be filled with gravel borrow and/or loam, whichever is appropriate to the proposed ground surface.

3.04 DISPOSAL:

All material collected in the course of the clearing and grubbing which is not to remain shall be disposed of in a satisfactory manner away from the site or as otherwise approved. Such disposal shall be carried on as promptly as possible and shall not be left until the final clean-up period.

END OF SECTION

SECTION 02240

DEWATERING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section specifies designing, furnishing, installing, maintaining, operating and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; disposing of pumped water; constructing, maintaining, observing and, except where indicated or required to remain in place, removing of equipment and instrumentation for control of the system.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01570, ENVIRONMENTAL PROTECTION
- C. Section 02252, SUPPORT OF EXCAVATION
- D. Section 02300, EARTHWORK

1.03 SYSTEM DESCRIPTION:

- A. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

1.04 QUALITY ASSURANCE:

- A. The Contractor is responsible for the adequacy of the dewatering systems.
- B. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation bottom, unless otherwise directed by the Engineer, so that all excavation bottoms are firm and dry.
- C. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenances to be built therein have been completed to the extent that they will not be floated or otherwise damaged.
- D. The dewatering system and excavation support (see Section 02252, SUPPORT OF EXCAVATION) shall be designed so that lowering of the groundwater level outside the excavation does not adversely affect adjacent structures, utilities or wells.

1.05 SUBMITTALS

- A. Contractor shall submit six copies of a plan indicating how they intend to control the discharge from any dewatering operations on the project, whether it is discharge of groundwater from excavations or Stormwater runoff during the life of the project.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 DEWATERING OPERATIONS:

- A. All water pumped or drained from the work shall be disposed of in a manner that will not result in undue interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures and utilities. Suitable temporary pipes, flumes or channels shall be provided for water that may flow along or across the site of the work. All disposal of pumped water shall conform to the provisions of Section 01570 ENVIRONMENTAL PROTECTION and Section 00890 PERMITS.
- B. Dewatering facilities shall be located where they will not interfere with utilities and construction work to be done by others.
- C. Dewatering procedures to be used shall be as described below:
 - 1. Crushed stone shall encapsulate the suction end of the pump to aid in minimizing the amount of silt discharged.
 - 2. For dewatering operations with relatively minor flows, pump discharges shall be directed into hay bale sedimentation traps lined with filter fabric. Water is to be filtered through the hay bales and filter fabric prior to being allowed to seep out into its natural watercourse.
 - 3. For dewatering operations with larger flows, pump discharges shall be into a steel dewatering basin. Steel baffle plates shall be used to slow water velocities to increase the contact time and allow adequate settlement of sediment prior to discharge into waterways.
 - 4. Where indicated on the contract drawings or in conditions of excess silt suspended in the discharge water, silt control bags shall be utilized in catch basins.
- D. The Contractor shall be responsible for repair of any damage caused by his dewatering operations, at no cost to the Owner.

END OF SECTION

SECTION 02252

SUPPORT OF EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers wood and steel sheeting or soldier piles and lagging with internal bracing for support of excavations. The requirements of this section shall also apply, as appropriate, to any methods of excavation support and underpinning which the Contractor elects to use to complete the work.
- B. The Contractor shall furnish and place timber or steel sheeting or soldier piles and lagging of the kinds and dimensions required, complying with these specifications, where required by regulation, indicated on the drawings or ordered by the Engineer.
- C. Vibration monitoring shall be provided during installation and extraction of sheeting whenever the braced excavation is adjacent to existing structures, in critical areas as noted in the contract documents, or as requested by the Engineer.
- D. Routine monitoring of the in-place excavation support system shall be provided.

1.02 RELATED WORK:

- A. Section 02240, DEWATERING
- B. Section 02300, EARTHWORK

1.03 QUALITY ASSURANCE:

- A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Safety and Department of Labor, Division of Occupational Safety “Excavation & Trench Safety Regulation (520 CMR 14.00)” and “Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.).” Contractors shall be familiar with the requirements of these regulations.
- B. The Contractor is responsible for the adequacy of the excavation support system and shall retain the services of a Professional Engineer registered in the state where the project is located to design the required excavation support systems. The Contractor's Professional Engineer shall practice in a discipline applicable to excavation work, shall have experience in the design of excavation support systems and shall design in conformance with OSHA requirements. The Contractor's Professional Engineer shall provide sufficient on-site inspection and supervision to assure that the excavation support system is installed and functions in accordance with his design. Criteria listed herein defining the responsibilities of the Contractor's Professional Engineer are minimum requirements.

1.04 REFERENCES:

The following standards form a part of this specification as referenced herein.

American Society for Testing and Materials (ASTM)

ASTM	A6	General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use
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ASTM	A328	Steel Sheet Piling
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1.05 SUBMITTALS:

- A. At least three weeks before starting installation of the excavation support system, the Contractor shall submit the attached Certificate of Design completed and signed by the Contractor and the Professional Engineer, identifying the Contractor's Professional Engineer who will be responsible for design of the excavation support system, and including, for record purposes only:
 - 1. An overall time schedule for construction of the braced excavation system.
 - 2. A description of the anticipated sequence of construction.
 - 3. Three (3) copies each of:
 - a. Complete details of braced excavation methods, equipment and sizes and lengths of materials proposed to be used.
 - b. Details of vibration monitoring devices and reports.
 - c. Details of the means and methods that will be used in monitoring the integrity of the support system during its entire period of use to insure the safety of the excavation.
 - d. Complete computations for the design of the braced excavation system bearing the seal of the responsible Professional Engineer duly registered licensed to practice within a discipline applicable to excavation work, in the state where the project is located.
 - e. Any other pertinent data required for record purposes by the Engineer.
- B. Receipt of the information by the Engineer will not relieve the Contractor of the sole responsibility for the adequacy of the braced excavation system, and for assuring that there will be no resulting damage to adjacent pavement, utilities or structures, and for providing safe conditions within the sheeted areas.
- C. Further for the record, upon completion of the work of this section, the Contractor shall submit 3 copies of all records of survey, vibration monitoring and inspection of existing structures to the Owner's Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Timber sheeting shall be sound spruce, pine, or hemlock, and either tongue and grooved or splined. Timber sheeting shall not be less than nominal 2 inches thick.
- B. Where steel sheet piling is indicated on the drawings or installation is ordered by the Engineer or required by OSHA standards, the material shall be of such size and strength as required by the excavation support design prepared and submitted by the Contractor's Professional Engineer. Steel sheet piling may be new or used material but shall not contain splices, cutouts, patches, or other alterations which would impair its integrity or strength. Steel sheeting shall be an approved standard section, weighing not less than 22 pounds per square foot of wall and conforming to ASTM A6 and A328.
- C. Where soldier piles and lagging are used, the steel piles shall conform to ASTM A6, and the lagging shall meet the requirements for timber sheeting, as defined above.
- D. Timber and steel used for bracing shall be of such size and strength as required in the excavation support design prepared and submitted by the Contractor's Professional Engineer. Timber or steel used for bracing shall be new or undamaged used material, which does not contain splices, cutouts, patches, or other alterations, which would impair its integrity or strength.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Work shall not be started until all materials and equipment necessary for construction are either on the site of the work or satisfactorily available for immediate use as required.
- B. The sheeting/lagging shall be sufficiently tight to minimize any resulting lowering of the groundwater level outside the excavation, as required in Section 02240, DEWATERING.
- C. The sheeting/piling shall be driven by approved means to the design elevation. No ends or edges of sheeting/piling shall be left exposed in a manner, which could create a possible hazard to safety of the public or a hindrance to traffic of any kind.
- D. If boulders or very dense soils are encountered, making it impractical to drive a sheeting/piling section to the desired depth, the section shall be treated as directed by the Contractor's Engineer.
- E. Within seven days of completing the initial installation of the earth support system, the Contractor shall submit a certification from his Professional Engineer, stating that the excavation support system as installed is in general compliance with the design or approved modifications thereto.
- F. The sheeting/piling shall be left in place where indicated on the drawings or ordered by the Engineer in writing. At all other locations, the sheeting/piling may be left in place or salvaged at the option of the Contractor. Wood or steel sheeting/piling permanently left in place shall be cut off at a depth of not less than two feet below finish grade unless otherwise directed.
- G. All cut-off material is the property of the Contractor and shall be promptly removed by him from the site.

- H. The satisfactory construction and maintenance of the excavation support system, complete in place, shall be the responsibility of the Contractor.
- I. The Contractor shall be responsible for promptly repairing all damage to adjacent structures caused by the installation, performance, or removal of the excavation support system.

CERTIFICATE OF DESIGN

RE: Contract between

OWNER:

and

CONTRACTOR:

on

CONTRACT:

(Name)

(Name)

(Title)

(Number)

(Date)

The undersigned hereby certify that the engineer listed below:

1. Is licensed or registered to perform professional engineering work in the state of _____;
(Location of Project)
2. Is qualified by education and training to design the _____
specified in Section _____ of subject contract;
3. Has previously designed comparable excavation support systems;
4. Has prepared the design in full compliance with the requirements of subject contract, including all applicable laws, regulations, rules, and codes; and
5. Will inspect and supervise installation of the excavation support system and will monitor the in-place system to confirm that the system is installed and functions in accordance with the design.

CONTRACTOR

ENGINEER

By: _____
(Signature)

By: _____
(Signature)

(Name)

(Name)

(Title)

(Engineering Discipline)

(Date)

(Date)

END OF SECTION

SECTION 02300

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01110, CONTROL OF WORK AND MATERIALS
- C. Section 01570, ENVIRONMENTAL PROTECTION
- D. Section 02240, DEWATERING
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02745, PAVING
- G. Section 02920, LOAMING AND SEEDING

1.03 REFERENCES:

American Society for Testing and Materials (ASTM)

ASTM	C131	Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
ASTM	C136	Method for Sieve Analysis of Fine and Coarse Aggregates.
ASTM	C330	Specification for Lightweight Aggregate for Structural Concrete.
ASTM	D1556	Test Method for Density of Soil in Place by the Sand Cone Method.
ASTM	D1557	Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop.
ASTM	D2922	Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).

Commonwealth of Massachusetts Highway Department Standard Specification for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 14.00 Excavation & Trench Safety Regulation

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Samples of all materials proposed for the project shall be submitted to the Engineer for review. Size of the samples shall be as approved by the Engineer.

1.05 PROTECTION OF EXISTING PROPERTY:

- A. The work shall be executed in such manner as to prevent any damage to facilities at the site and adjacent property and existing improvements, such as but not limited to streets, curbs, paving, service utility lines, structures, monuments, bench marks, observation wells, and other public or private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout and other hazards created by earthwork operations.
- B. In case of any damage or injury caused in the performance of the work, the Contractor shall, at its own expense, make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing roads, sidewalks, and curbs damaged during the project work shall be repaired or replaced to at least the condition that existed at the start of operations. The Contractor shall replace, at his own cost, existing benchmarks, observation wells, monuments, and other reference points, which are disturbed or destroyed.
- C. Buried drainage structures and pipes, observation wells and piezometers, including those which project less than eighteen inches (18") above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard. Markers shall indicate limits of danger areas, by means which will be clearly visible to operators of trucks and other construction equipment, and shall be maintained at all times until completion of project.

1.06 DRAINAGE:

- A. The Contractor shall provide, at its own expense, adequate drainage facilities to complete all work items in an acceptable manner. Drainage shall be done in a manner so that runoff will not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or abutting properties.

1.07 FROST PROTECTION AND SNOW REMOVAL:

- A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.
- B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. GRAVEL BORROW:

Gravel Borrow shall satisfy the requirements listed in MHD Specification Section M1.03.0, Type b.

B. CRUSHED STONE:

Crushed stone shall satisfy the requirements listed in MHD Specification Section M2.01.

C. SAND BORROW:

Sand Borrow shall satisfy the requirements listed in MHD Specification Section M1.04.0.

D. PEASTONE:

Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

Passing 5/8 inch square sieve opening	-	100%
Passing No. 8 sieve opening	-	0%

E. BACKFILL MATERIALS:

1. Class B Backfill:

Class B backfill shall be granular, well graded friable soil; free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
3"	100
No. 10	30-95
No. 40	10-70
No. 200	0-10

F. STATE HIGHWAY TRENCH BACKFILL:

When required by Permit, Controlled Density Fill (CDF) shall be used to backfill trenches. The CDF shall satisfy the requirements listed in MHD Specification Section M4.08.0.

G. PROCESSED GRAVEL:

1. Processed gravel shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.
2. The gradation shall meet the following requirements:

<u>Sieve Designation</u>	<u>Percentage Passing</u>
3 in.	100
1 1/2 in.	70-100
1/4 in.	50-85
No. 4	30-60
No. 200	0-10

3. The approved source of bank-run gravel material shall be processed by mechanical means. The equipment for producing crushed gravel shall be of adequate size with sufficient adjustments to produce the desired materials. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

PART 3 - EXECUTION

3.01 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION:

- A. Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures.
- B. All excavated or filled areas disturbed during construction, all loose or saturated soil, and other areas that will not meet compaction requirements as specified herein shall be removed and replaced with a minimum 12-inch layer of compacted crushed stone wrapped all around in non-woven filter fabric. Costs of removal and replacement shall be borne by the Contractor.
- C. The Contractor shall place a minimum of 12-inch layer of special bedding materials and crushed stone wrapped in filter fabric over the natural underlying soil to stabilize areas which may become disturbed as a result of rain, surface water runoff or groundwater seepage pressures, all at no additional cost to the Owner. The Contractor also has the option of drying materials in-place and compacting to specified densities.

3.02 EXCAVATION:

- A. GENERAL:

1. The Contractor shall perform all work of any nature and description required to accomplish the work as shown on the Drawings and as specified.
2. Excavations, unless otherwise required by the Engineer, shall be carried only to the depths and limits shown on the Drawings. If unauthorized excavation is carried out below required subgrade and/or beyond minimum lateral limits shown on Drawings, it shall be backfilled with gravel borrow and compacted at the Contractor's expense as specified below, except as otherwise indicated. Excavations shall be kept in dry and good conditions at all times, and all voids shall be filled to the satisfaction of the Engineer.
3. In all excavation areas, the Contractor shall strip the surficial topsoil layer and underlying subsoil layer separate from underlying soils. In paved areas, the Contractor shall first cut pavement as specified in paragraph 3.02 B.1 of this specification, strip pavement and pavement subbase separately from underlying soils. All excavated materials shall be stockpiled separately from each other within the limits of work.
4. The Contractor shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering and which will allow visual observation of the bottom and backfill in the dry.
5. The Contractor shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as directed by the Engineer. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise directed by the Engineer, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all around in non-woven filter fabric.

B. TRENCHES:

1. Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.
2. The Contractor shall satisfy all dewatering requirements specified in Section 02240 DEWATERING, before performing trench excavations.
3. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.
4. Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.
5. If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.

6. Pipe trenches shall be made as narrow as practicable and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.
7. If, in the opinion of the Engineer, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the Contractor shall remove such disturbed subgrade to a minimum of 12 inches and replace with crushed stone wrapped in filter fabric. Cost of removal and replacement shall be borne by the Contractor.
8. The Contractor shall obtain a trench permit from the municipality where the trench is located prior to making any excavations of trenches (any subsurface excavation greater than three (3) feet in depth and fifteen (15) feet or less between soil walls as measured from the bottom).
9. All trenches required to be permitted must be attended, covered, barricaded, or backfilled. Covers must be road plates at least ¾-inch thick or equivalent, barricades must be fences at least 6-feet high with no openings greater than 4-inches between vertical supports and all horizontal supports required to be located on the trench-side of the fencing.

C. EXCAVATION NEAR EXISTING STRUCTURES:

1. Attention is directed to the fact that there are pipes, manholes, drains, and other utilities in certain locations. An attempt has been made to locate all utilities on the drawings, but the completeness or accuracy of the given information is not guaranteed.
2. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and excavation shall be done by means of hand tools, as required. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.
3. Where determination of the exact location of a pipe or other underground structure is necessary for properly performing the work, the Contractor shall excavate test pits to determine the locations.

3.03 BACKFILL PLACEMENT AND COMPACTION:

A. GENERAL:

1. Prior to backfilling, the Contractor shall compact the exposed natural subgrade to the densities as specified herein.
2. After approval of subgrade by the Engineer, the Contractor shall backfill areas to required contours and elevations with specified materials.
3. The Contractor shall place and compact materials to the specified density in continuous horizontal layers. The degree of compaction shall be based on maximum dry density as determined by ASTM Test D1557, Method C. The minimum degree of compaction for fill placed shall be as follows:

Percent of

<u>Location</u>	<u>Maximum Density</u>
Below pipe centerline	95
Above pipe centerline	92
Below pavement (upper 3 ft.)	95
Embankments	95
Below pipe in embankments	95
Adjacent to structures	92
Below structures	95

4. The Engineer reserves the right to test backfill for conformance to the specifications and Contractor shall assist as required to obtain the information. Compaction testing will be performed by the Engineer or by an inspection laboratory designated by the Engineer, engaged and paid for by the Owner. If test results indicate work does not conform to specification requirements, the Contractor shall remove or correct the defective Work by recompacting where appropriate or replacing as necessary and approved by the Engineer, to bring the work into compliance, at no additional cost to the Owner. All backfilled materials under structures and buildings shall be field tested for compliance with the requirements of this specification.
5. Where horizontal layers meet a rising slope, the Contractor shall key each layer by benching into the slope.
6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the Contractor has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the Owner.
7. The Contractor shall remove loam and topsoil, loose vegetation, stumps, large roots, etc., from areas upon which embankments will be built or areas where material will be placed for grading. The subgrade shall be shaped as indicated on the Drawings and shall be prepared by forking, furrowing, or plowing so that the first layer of the fill material placed on the subgrade will be well bonded to the subgrade.

B. TRENCHES:

1. Bedding as detailed and specified shall be furnished and installed beneath the pipeline prior to placement of the pipeline. A minimum bedding thickness shall be maintained between the pipe and undisturbed material, as shown on the Drawings.
2. As soon as practicable after pipes have been laid, backfilling shall be started.
3. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

4. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.
5. Water Jetting:
 - a. Water jetting may be used when the backfill material contains less than 10 percent passing the number 200 sieve, but shall be used only if approved by the Engineer.
 - b. Contractor shall submit a detailed plan describing the procedures he intends to use for water jetting to the Engineer for approval prior to any water jetting taking place.
 - c. Compaction of backfill placed by water jetting shall conform to the requirements of this specification.
6. If the materials above the trench bottom are unsuitable for backfill, the Contractor shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.
7. Should the Engineer order crushed stone for utility supports or for other purposes, the Contractor shall furnish and install the crushed stone as directed.
8. In shoulders of streets and road, the top 12-inch layer of trench backfill shall consist of processed gravel for sub-base, satisfying the requirements listed in MHD standard specification M1.03.1.
9. Trenches in state highways shall be backfilled with Controlled Density Fill, in accordance with the state highway permit included in Section 00890, PERMITS.

C. BACKFILLING UNDER BUILDINGS AND FOUNDATIONS:

Material to be used as structural fill under structures shall be special bedding material or gravel borrow, as shown on the Drawings or as directed by the Engineer. Where gravel borrow fill is required to support proposed footings, walls, slabs, and other structures, the material shall be placed in a manner accepted by the Engineer. Compaction of each lift shall meet the density requirements of this specification.

D. BACKFILLING ADJACENT TO STRUCTURES:

1. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads to which they will be subjected. Excavated material approved by the Engineer may be used in backfilling around structures. Backfill material shall be thoroughly compacted to meet the requirements of this specification.
2. Contractor shall use extra care when compacting adjacent to pipes and drainage structures. Backfill and compaction shall proceed along sides of drainage structures so that the difference in top of fill level on any side of the structure shall not exceed two feet (2') at any stage of construction.

3. Where backfill is to be placed on only one side of a structural wall, only hand-operated roller or plate compactors shall be used within a lateral distance of five feet (5') of the wall for walls less than fifteen feet (15') high and within ten feet (10') of the wall for walls more than fifteen feet (15') high.

3.04 DISPOSAL OF SURPLUS MATERIALS:

- A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.
- B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by him. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.
- C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.
- D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and/or hazardous materials present in the soil being disposed or reused.

END OF SECTION

SECTION 02427

FLOW ISOLATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all materials, equipment, and labor required to conduct flow isolation on individual sewer reaches.

1.02 RELATED WORK:

- A. Section 01330 - SUBMITTALS
- B. Section 01575 - HANDLING EXISTING FLOWS

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

The Owner shall provide the Contractor with a Microsoft Excel Table for Post Flow Isolation with all manhole-to-manhole information pre-entered. The table will have blank fields to record each flow isolation reading. The contractor shall complete the table with the data collected during the flow isolation procedure. Any observed infiltration from manholes shall be noted in the Table and shall not be included in the measured manhole-to-manhole value.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.01 SPOT FLOW ISOLATION

- A. Spot flow isolation readings shall be taken as directed by the Engineer.
- B. The Contractor shall take spot weir measurements at a downstream manhole using portable, precalibrated weirs. Plugging of upstream sewer shall be required.
- C. Data shall be delivered in a format similar to 1.03 above.

3.02 POST FLOW ISOLATION:

- A. Following the completion of all rehabilitation work, flow isolation shall be conducted by the Contractor on all sewer reaches that are rehabilitated during the project. Readings shall be recorded one manhole-to-manhole segment at a time, unless directed by the Engineer.
- B. Individual manhole to manhole sewer segments shall be flow isolated by plugging flow at the upstream manhole and taking weir measurements at the downstream manhole using portable, precalibrated weirs.

- C. Flow isolation shall be performed between the hours of 12:00AM and 6:00AM during periods of high ground water and dry weather. The Engineer will determine if the groundwater and weather conditions are appropriate to conduct flow isolation. If the conditions are not appropriate, the Engineer may require that flow isolation be completed as part of the “One Year” warranty inspection process.
- D. The manhole numbering system as indicated on the contract drawings shall be used to identify the manhole-to-manhole reaches that are flow isolated.

END OF SECTION

SECTION 02428

CURED-IN-PLACE PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers installation of cured-in-place pipe as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS
- E. Section 02440, SEWER CLEANING AND INSPECTION
- F. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

The National Association of Sewer Service Companies (NASSCO)
Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, installation of cured-in-place pipe shall be carried out in accordance with ASTM F1216, Section 7.
- B. Curing of liner tube using hot water or steam shall be acceptable.
- C. The Contractor shall design all cured-in-place liners assuming partially deteriorated pipe conditions and a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the sanitary sewer line to be rehabilitated unless otherwise noted below.
- D. The Contractor may propose alternative cured-in-place processes and/or products for review and approval by the Engineer.
- E. The location, length, and approximate interior dimensions of the cured-in-place pipe to be installed are as shown on the drawings.
- F. The Contractor shall provide MSDS for all chemicals used in the lining process.
- G. The following line segments require a structural liner for the given stationing. These line segments shall be designed assuming “fully deteriorated pipe” conditions as outlined in ASTM F 1216 using a groundwater height above the crown of the pipe equal to one-half (50%) of the distance between the ground surface and the invert of the sanitary sewer line to be rehabilitated.

BASE BID CURED-IN-PLACE STRUCTURAL PIPE

SUBAREA	MH	to	MH	PIPE DIAMETER	AVERAGE DEPTH (v.f.)	PIPE LENGTH (l.f.)
B016	068		067	8	9	152
B022	090		078	8	9	380
B022	103		087	8	13	366
B022	116		112	8	10	125
B029	041		070	8	9	43
B029	063		064	8	13	320

ALTERNATE BID NO. 2 CURED-IN-PLACE STRUCTURAL PIPE

SUBAREA	MH	to	MH	PIPE DIAMETER	AVERAGE DEPTH (v.f.)	PIPE LENGTH (l.f.)
B016	013		014	8	10	304
B016	029		030	8	10	293
B029	046		045	8	5	265
B029	046		047	8	7	169
B029	050		063	8	18	230
B029	080		081	8	10	122

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
1. Qualifications of the firm/personnel who will perform the Work.
 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 3. Description of the system, equipment and material proposed for the cured-in-place pipe.
 4. Manufacturer's warranty.
- B. Prior to beginning the work, the Contractor shall submit, a written plan for contacting homeowners whose service connections may be affected due to the installation of liner. The plan shall be subject to approval by the Engineer and the Owner.
- C. The Contractor shall submit the following information for each inversion within 21 days following completion of the liner installation.
- Pre-inversion television inspection logs and DVDs (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
 - Liner order sheet describing the material ordered
 - Service connection reinstatement sign-off sheet
 - Thermo couple log kept during inversion process
 - Post-inversion television inspection logs and DVDs (Video files shall also be included on external hard drives as described in Section 01331, DOCUMENTATION)
 - Material testing results

Information should be organized by inversion and two (2) copies shall be delivered.

1.07 WARRANTY:

The cured-in-place pipe shall be warranted against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Materials used for the cured-in-place pipe shall meet the requirements of ASTM F1216.
- B. Cured-in-place pipe shall be as manufactured by Insituform Technologies, National Liner, Cure-Line, or approved equal.
- C. Hydrophylic rubber gaskets shall have two (2) beads of material protruding from one side of the strip and shall swell to a minimum of three times its dry size when in contact with water. Flat types of gaskets shall not be accepted. Gaskets shall be a manufactured by Hydrotite or approved equal.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION and shall not be measured separately for payment.

3.02 FLOW CONTROL:

Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 WATER FOR CONSTRUCTION PURPOSES:

Availability of water for construction purposes shall be in accordance with Section 01140, SPECIAL PROVISIONS.

3.04 NOTIFICATION:

- A. The Contractor shall affix a written notice to the door of each home that has sewer service through the pipe being lined one week prior to the lining operation and again one day before the lining operation. A notice shall also be distributed following service connection reinstatement stating that the service connection has been restored to service.
- B. The written notice must be approved by the Engineer prior to its distribution.
- C. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to the lining operation.

3.05 INSTALLATION:

- A. Each sewer segment shall be television inspected prior to the installation of the cured-in-place liner. The inspection shall be performed in "dry-pipe" conditions with no flow in the pipe. The pipe shall be clean and free of all obstructions prior to installation of the liner.
- B. Prior to installation of the cured-in-place pipe the Contractor shall install a hydrophilic rubber gasket on the inside of each pipe where it meets a manhole such that the hydrophilic rubber gasket is between the host pipe and the cured-in-place pipe. The annular space shall be made watertight at the ends of the liner in the manholes.
- C. Installation of the cured-in-place pipe shall be in accordance with ASTM F1216, Section 7.
- D. After the liner has been cured in place, the Contractor shall reinstate all active service connections as directed by the Engineer. Reinstatement of service connections shall be paid under its own bid item. Branch connections to buildings shall be reinstated to a minimum of 95% of the inside diameter of the existing service connection without excavation, utilizing a remotely controlled cutting device, monitored by a video TV camera. No additional payment will be made for excavations for the purpose of reinstating connections and the contractor will be responsible for all cost and liability associated with such excavation and restoration work.
- E. The Contractor and Engineer shall discuss and agree on which service connections will be reinstated. The service connections to be reinstated for each inversion will be listed on the attached

form (Service Connection Reinstatement Certification Form) and will be signed by an authorized representative of the Contractor and Resident Representative.

- F. The Contractor shall make a mainline television inspection camera available for confirming service connections to be reinstated. At the Engineer's discretion, the Contractor shall dye test service connections in order to confirm that each service connection that should be reinstated is included on the attached Service Connection Reinstatement Certification Form. No additional payment will be made for television inspection in conjunction with dye testing of service connections.
- G. All reinstated service connections shall be sealed with grout in accordance with Section 02443, SERVICE CONNECTION REHABILITATION. The Contractor shall make certain that the annular space between the host pipe and the cured-in-place pipe is fully sealed with grout.
- H. Each sewer segment shall be television inspected after the liner installation and service grouting have been completed. The inspection shall be performed in "dry-pipe" conditions with no flow in the pipe. Post rehabilitation television inspection shall be performed prior to removing any sewer bypass equipment. Post rehabilitation television inspection shall be considered incidental to the lining process and shall not be measured separately for payment.

3.06 TESTING REQUIREMENTS:

- A. Cured-in-place pipe samples shall be prepared and tested by the Contractor in accordance with ASTM F1216 Section 8.1 unless otherwise stated in this section.
- B. The Contractor shall obtain samples for 25% of all pipe inversions, as directed by the Engineer.
- C. If field conditions or pipe shape prevent the Contractor from obtaining the samples as specified in ASTM 1216 Section 8.1 the samples shall be taken as directed by the Engineer.
- D. An independent testing laboratory shall test the cured-in-place pipe samples and the results are to be sent directly to the Engineers Resident Project Representative within 21 calendar days following the completion of each inversion.
- E. The cost of obtaining the samples and testing shall be the sole responsibility of the Contractor and shall be considered incidental to the lining process.
- F. Inversions where the cured-in-place pipe samples that do not meet the requirements of ASTM D790 and D638 as indicated in ASTM 1216 Section 8 will be re-televised by the Contractor in "dry pipe" conditions, as directed by the Engineer, at no additional cost to the Owner, for review by the Engineer. Liner deemed unacceptable by the Engineer will be removed and replaced at no additional cost to the owner.

3.07 FIELD TESTING/INSPECTION:

- A. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall clean and television inspect 100% of the cured-in-place pipes in accordance with Section 02440, SEWER CLEANING AND INSPECTION. The contractor shall repair any defects found in the cured-in-place pipe. The contractor shall reseal the annular space between the sewer main and the cured-in-place pipe at manhole locations and service connections until there are no visible leaks through television inspection.

- B. All inspecting and resealing or lining within the warranty period shall be provided at no additional cost to the Owner.

SERVICE CONNECTION REINSTATEMENT CERTIFICATION FORM

The Contractor and Engineer shall review sewer tie cards, television inspection tapes, and perform dye tests as necessary to determine which service connections should be reinstated following installation of a Cured-in-Place Liner. Details regarding the location of each service connection that will be reinstated, including Manhole-to-Manhole reach, stationing, and clock position shall be recorded on this form.

Service Connections to be Reinstated (Clock Position)

Inversion # _____ MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

MH _____ to MH _____

The Contractor shall be responsible for reinstatement of service connections following Cured-in-Place Lining as described above. If these service connections are found, at any future date, not to have been reinstated, the Contractor shall reinstate them within three (3) calendar days of notification, at his sole expense.

Contractor

Signature

Date

Print Name

Resident Representative

Signature

Date

Print Name

END OF SECTION

SECTION 02429

CURED-IN-PLACE SHORT LINER

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers installation of cured-in-place short liners as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS
- E. Section 02428, CURED-IN-PLACE PIPE
- F. Section 02440, SEWER CLEANING AND INSPECTION
- G. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 QUALITY ASSURANCE:

The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

The National Association of Sewer Service Companies (NASSCO) Recommended Specifications for Sewer Collection System Rehabilitation (Current edition).

1.05 SYSTEM DESCRIPTION:

- A. The cured-in-place short liners shall be epoxy resin impregnated cured-in-place liners, installed where indicated on the drawings. The short liners shall be thoroughly impregnated with epoxy resin prior to insertion and upon curing shall form a hard, impervious, corrosion resistant lining. When cured, the short liner shall be formed to the internal circumference of the host pipe. The short liner shall be impervious to water and shall not allow infiltration to migrate between the liner and the host pipe at either end of the liner or in the area where a service connection has been reinstated.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Prior to beginning the work, submit six (6) sets of the following:

1. Qualifications of the firm/personnel who will perform the Work.
2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
3. Description of the system, equipment and material proposed for the cured-in-place short liners.
4. Manufacturer's Warranty.

1.07 WARRANTY:

The short liners shall be warranted against infiltration and faulty workmanship and materials for one year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS:

Materials used for the cured-in-place short liners shall meet the requirements of ASTM F1216.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

3.02 FLOW CONTROL:

Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 STRUCTURAL REQUIREMENTS:

The design of the cured-in-place short liners shall meet the requirements of ASTM F1216 X1, taking into consideration the condition of the original pipe.

3.04 INSTALLATION:

- A. The cured-in-place short liner installation procedures shall be in accordance with the manufacturer's written instructions, and as herein specified.
- B. The edges of the short liners shall be tapered at both ends.
- C. No significant pipe volume change shall occur due to installation of the short liners.
- D. The short liners shall be installed so as to force excess resin into any cracks, joints or other surface defects of the existing interior pipe wall surface.
- E. Each short liner shall have a minimum length of three (3) linear feet. The location and length of the short liners shall be as indicated on the drawings and as directed by the Engineer.
- F. After the short liner has been cured in place, the Contractor shall reinstate the existing service connections. Branch connections to buildings shall be reopened without excavation, per ASTM F1216, paragraph 7.9. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.
- G. After the existing service connections have been reinstated, the Contractor shall grout the service connections, in accordance with Section 02443, SERVICE CONNECTION REHABILITATION. The Contractor shall make certain that the annular space between the sewer main and the cured-in-place short liner is fully sealed with grout. No additional payment shall be made for grouting service connections.

3.05 FIELD TESTING/INSPECTION:

- A. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall television inspect 100% of the short liners in accordance with paragraph 3.02 of Section 02440, SEWER CLEANING AND INSPECTION. The Contractor shall repair any defects found and shall seal the annular space between the liner and the host pipe until there are no visible leaks through television inspection.
- B. All inspecting and sealing within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

SECTION 02435

SEWER MANHOLE REHABILITATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of sewer manholes as called for herein and on the drawings. It is the intent of this specification to provide for the waterproofing, sealing, and structural enhancement of existing manholes by chemical grout exterior and by application of a uniform cementitious layer of high-quality mortar. Additional manhole rehabilitation related items include manhole root treatment, install manhole frame and cover, build manhole bench and invert, and rehabilitation of manhole B040-6.
- B. The work shall include: elimination of infiltration by external chemical grout sealing; removal and patching of loose and/or unsound material; cleaning and preparation of surfaces; repair of invert, bench, and walls; and spray application of a cementitious mix to form a liner. Other repairs shall be completed as indicated on the drawings and described herein.
- C. The contractor shall furnish all equipment, material and labor required to perform all manhole rehabilitations described in this specification.
- D. External grouting of inverts, bench, walls, corbel, and pipe connections shall be performed prior to application of cementitious mix.
- E. Manhole inspection logs are included in Appendix A for reference.

1.02 RELATED WORK:

- A. Section 00331 TV INSPECTION LOGS AND MH INSPECTION REPORTS
- B. Section 01014, SCOPE AND SEQUENCE OF WORK
- C. Section 01330, SUBMITTALS
- D. Section 01331, DOCUMENTATION
- E. Section 01575, HANDLING EXISTING FLOWS
- F. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)
Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

American Society for Testing and Materials (ASTM)

ASTM C94	Ready-Mix Concrete
ASTM C109	Comprehensive Strength
ASTM C267	Chemical Resistance
ASTM C596	Shrinkage
ASTM C666, Method A	Freeze/Thaw Resistance
ASTM D4414	Standard Practice for Measurement of Wet Film Thickness for Organic Coatings
ASTM 543	Resistance of Plastics to Chemical Reagents
ASTM 638	Tensile Properties of Plastic
ASTM 695	Comprehensive Properties of Rigid Plastics
ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics

1.05 CEMENTITIOUS LINING SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, sewer manhole sealing shall be carried out in accordance with the current edition of MANHOLE REHABILITATION, CEMENTITIOUS (As provided by the Strong Systems, Inc. for the Strong Seal System) and MANHOLE SEALING 3(3.1) (excluding item c) of NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The locations of the cementitious lining work to be completed are as shown on the drawings.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
1. Qualifications of the firm/personnel who will perform the work.
 2. Provide at least five (5) references of different projects in which at least 50 manholes have been rehabilitated by the firm within the past three (3) years.
 3. Description of the system, equipment and material with MSDS proposed for sewer manhole rehabilitation.
 4. Description of the system proposed for bypass pumping during the procedures to be carried out.

5. Manufacturer's warranty

- B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted.

1.07 WARRANTY:

- A. The manhole rehabilitation work performed shall be warranted against infiltration and faulty workmanship and materials for a period of one (1) year after the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 REHABILITATION MATERIALS:

All products used for lining, sealing, patching, and cleaning shall be environmentally safe. The contractor shall submit MSDS for all materials used.

2.02 SEALING OF INVERT, STOPPING ACTIVE LEAKS AND EXTERIOR CHEMICAL SEALING:

The contractor shall use a chemical grout that is environmentally safe for the sealing of sewers. The chemical grout shall be in accordance with CHEMICAL SEALING (GROUTING) MATERIALS of the NASSCO Standard Specifications.

2.03 PATCHING MIX:

A quick-setting cementitious material shall be used as a patching mix and is to be mixed and applied according to the manufacturer's recommendation and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	6 hr 1,400 psi
Shrinkage	ASTM C-596	0% AT 90% Relative Humidity

2.04 INFILTRATION CONTROL MIX:

A rapid-setting cementitious product specifically for leak control shall be used to stop water infiltration and shall be mixed and applied according to the manufacturer's recommendations and shall have the following minimum requirements.

Compressive Strength	ASTM C-109	1 hr 600 psi
Compressive Strength	ASTM C-109	24 hr 1,800 psi

2.05 LINER MIX:

- A. The cementitious liner mix shall be used to form a structural enhancing monolithic liner covering all interior manhole surfaces and shall have the following minimum requirements at 28 days:

Compressive Strength	ASTM C-109	6,000 psi
Shrinkage	ASTM C-596	0%, 90% humidity
Freeze/Thaw Resistance	ASTM C-666	No visible damage after 100 cycles

- B. The liner mix shall be applied in one monolithic layer.

2.06 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of Portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; Portland cement to hydrated lime to sand.
- D. Cement shall be Type II Portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. Sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.07 CONCRETE:

- A. Cement shall be domestic Portland cement conforming to ASTM C150, Type II.
- B. Fine aggregate shall be washed natural sand conforming to ASTM C33.
- C. Coarse aggregate shall be well graded crushed stone conforming to ASTM C33, size No. 67.
- D. No admixtures shall be used unless approved by the Engineer in writing.

2.08 WATER:

Water used in mixing shall be potable.

2.09 DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be delivered to the site in the Manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. All materials shall be stored properly and in accordance with Manufacturer's instructions.

PART 3 - EXECUTION

3.01 SAMPLING AND TESTING OF LINER:

- A. The Owner reserves the right to test all materials.
- B. Products that fail to meet the requirements of these specifications shall not be incorporated in the work.

3.02 SURFACE PROTECTION:

- A. During progress of work, where appearance is important, adjacent areas or grounds which may be permanently discolored, stained, or otherwise damaged by dust and rebound, shall be adequately protected and, if contacted, shall be cleaned by early scraping, brushing or washing, as the surroundings permit.
- B. No street markings shall be removed or covered throughout the progress of work.

3.03 MANHOLE CHEMICAL ROOT TREATMENT

The Contractor shall provide manhole chemical root treatment where indicated on the drawings. The chemical root treatment shall be in accordance with Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT.

3.04 EXISTING FLOWS:

The Contractor shall divert flows as required for the work and in accordance with the requirements specified in Section 01575, HANDLING EXISTING FLOWS.

3.05 CEMENTITIOUS LINING:

A. PREPARATION:

1. Remove all foreign material from the manhole wall and bench using a high-pressure water spray (minimum 2,000 psi[DME1]). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick-setting patching mix. Surfaces to be repaired shall be clean and free of loose materials. Additional surface preparation shall be as recommended by the manufacturer of the materials to be applied.
2. Leaks shall be stopped using a chemical grout, which shall be applied as per the manufacturer's recommendations. Leaks may require weep holes drilled at the manhole base to localize the infiltration during the application, after which the weep holes shall be sealed with a chemical grout and plugged with the quick-setting infiltration control mix prior to the final liner application. Areas with evidence of previous leakage (e.g., mineral deposits) shall also be grouted.
3. All pipe connections in brick manholes shall be grouted regardless of whether they are leaking or have signs of previous leakage. Grout ports shall be located near the pipe connections to ensure that the sealing material is injected at the manhole/pipe connections.

B. INTERIOR SEALING

1. Interior lining of the manholes shall be conducted only after all other manhole rehabilitations have been completed.
2. Unless otherwise indicated herein, the Contractor shall carry out all work as described in SEWER MANHOLE REHABILITATION, CEMENTITIOUS LINER (as provided by Strong Systems, Inc., for the Strong Seal System), of the NASSCO Standard Specifications using lining materials and procedures accepted by the Engineer.
3. Preparation, as described in section 3.05 A, shall be completed prior to the placement of the cementitious liner.
4. Sealant shall not be placed on a frozen surface or during freezing weather. Sealant shall not be placed when it is anticipated that the temperature during the following 24 hours will drop below 32 degrees, Fahrenheit.
5. Pipes and/or service connections shall be temporarily plugged prior to the application of the cementitious manhole interior liner. A flash coat of the liner material shall be applied three (3) inches into each service connection. Temporary plugs shall be removed once the liner has cured sufficiently to prevent erosion of the new liner.
6. Thickness shall be verified with a wet gauge at random points of the new interior surfaces as directed by the Engineer. Minimum thickness of one-half (½) inch is required.
7. Application shall be with low velocity, continuous flow equipment to prevent the adverse effects of rebound. A smooth trowel finish shall be applied.
8. The Contractor shall prohibit debris from entering the invert by either covering the invert or plugging during application[DME2].

3.06 FURNISH AND INSTALL MANHOLE FRAME AND COVER

- A. Contractor shall excavate, remove, and deliver existing frames and covers to DPW Yard at 60 Elliot Street. The Contractor shall furnish and install new frames and covers at these locations. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by E.L. LeBaron Foundry Co. or approved equal.

- B. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A 4 inch thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
- C. Area surrounding the frame shall be paved with Class I Bituminous Concrete, Type I-1, minimum 4 inches thick, to match existing road surface, in accordance with Section 02745, PAVING.

3.07 BUILD MANHOLE INVERT AND BENCH[DME3]

- A. Existing manhole bench and invert (including debris, deteriorated brick, block, and mortar) shall be removed and disposed of.
- B. Manhole bench and invert shall be constructed in accordance with Section 02538, SANITARY SEWER MANHOLE BENCH AND INVERT.
- C. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- D. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
- E. Channels and shelves shall be constructed of brick and concrete as shown on the Drawings. The brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Brick surfaces exposed to sewage flow shall be constructed with a nominal 2 inch by 8 inch face exposed (i.e. bricks on edge).

3.08 SEWER MANHOLE REHABILITATION OF B040-6

- A. The Contractor shall be aware of previous attempts to rehabilitate manhole B040-6. Previous rehabilitations included cured-in-place lining through the manhole, sealing of underdrain cavern, exterior grouting, and cementitious lining.
- B. The Contractor shall be aware of heavy flows at the repair site including sanitary flow, underdrain flow, and groundwater. Any bypass pumping of sanitary flow, underdrain flow, and groundwater shall be considered incidental to the work.
- C. The Contractor shall remove access port cap to release water from underdrain. Upstream underdrain access ports may also need to be opened to dewater the underdrain. Contractor shall be responsible for any damage done in other manholes and shall return all affected manholes to their original condition following completion of work at manhole B040-6.

- D. The Contractor shall completely remove existing cavern wall and remove all material from the cavern.
- E. The cavern shall be re-sealed in accordance with Specifications Section 02770 SEALING OF UNDERDRAIN ACCESS PORTS.
- F. The Contractor shall remove all cement from the bench to expose original brickwork and shall stop all infiltration in accordance with Specifications Section 02435, SEWER MANHOLE REHABILITATION.
- G. The contractor shall furnish and install internal pipe joint seals at two (2) mainline pipe connections (approximate pipe dimension is 20" x 30".)
 - 1. Internal Pipe Joint Seal shall be manufactured by Cretex Specialty Products of Waukesha, WI or approved equal.
 - 2. Contractor shall cut, remove, and dispose of cured-in-place liner as necessary to install internal pipe joint seal at each pipe connection. The internal joint seals shall be installed to create a watertight seal between the cured-in-place liner and the host pipe at the manhole connection.
 - 3. Internal Pipe Joint Seal shall consist of rubber sleeve, expansion bands, and restraining hoops[DME4].
 - 4. Installation of internal pipe joint seal shall be in accordance with the manufacturer's instructions.
 - 5. The surface of the brick host pipe shall be smooth, non-porous and free of loose material and voids. Prior to the installation of the internal pipe joint seals, the Contractor shall apply a skim coat of mortar to the host brick pipe to create a smooth, non-porous surface prior to installation of the internal pipe joint seal.
 - 6. The Contractor shall field measure the pipe to determine the information requested on the manufacturer's "Sizing and Ordering" procedure. Measurements shall be approved by the Engineer prior to product order.
- H. Cementitious lining shall be performed after all other work has been performed in manhole B040-6.

3.09 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, the Contractor shall inspect 100% of the sewer manholes rehabilitated during this project. The Contractor shall repair any defects found until there are no defects or visible leaks.

- B. If the groundwater level is not, in the opinion of the Engineer, high enough for an accurate visual inspection, the Contractor shall test a 20% sample of the original manhole rehabilitation work using exfiltration as described in SEWER MANHOLE SEALING of the NASCCO Standard Specifications or vacuum methods as described in ASTM C-1244. The manholes in the test sample will be selected and approved by the Engineer and will consist of manholes from throughout the project area that are representative of the manhole rehabilitation work originally performed. Any manholes failing the warranty test shall be sealed and retested until the test is passed and/or the results are satisfactory to the Engineer.
- C. If any of the manholes fail the test an additional and equivalent test sample of the original manhole rehabilitation work shall be selected by the Engineer. Additional testing will be performed until all manholes pass the test. Previously tested manholes shall not be included in a subsequent test sample.
- D. All inspecting, testing, and reworking within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

SECTION 02437

SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers chemical root treatment of sewer lines and manholes as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS
- E. Section 02435, SEWER MANHOLE REHABILITATION
- F. Section 02440, SEWER CLEANING AND INSPECTION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)
Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, chemical root treatment of the specified lengths of pipe and manholes shall be carried out in accordance with SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Description of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for root treatment and cleaning of the pipe and manholes, including MSDS Data Sheets for all chemicals intended to be used.
 - 4. Manufacturer's warranty.
- B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted.

1.07 WARRANTY:

- A. The Contractor shall provide a written guarantee that meets or exceeds any claims or warranties made by the manufacturer in published advertising. As a minimum, the Contractor shall guarantee that virtually all root tissue present in the sewer pipe will be dead or unable to sustain life.

PART 2 - PRODUCTS

2.01 ROOT TREATMENT MATERIALS:

- A. The chemical root treatment material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use. The Contractor shall submit a specimen product label of the material to be used in chemical root treatment to the Engineer. The chemical root treatment material shall not permanently affect parts of trees distant from the treated roots.
- B. Materials shall meet the requirements of SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of the NASSCO Standard Specification.

PART 3 - EXECUTION

3.01 ROOT TREATMENT

- A. The Contractor shall carry out all preparatory work, including flow control, and apply root treatment as described in SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of the NASSCO Standard Specifications, using treatment materials accepted by the Engineer.

3.02 ROOT CLEANING

- A. Root cleaning shall be carried out under Section 02440, SEWER CLEANING AND INSPECTION.

END OF SECTION

SECTION 02440

SEWER CLEANING AND INSPECTION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers cleaning and inspection of pipelines as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein. The television inspection logs are included as Appendix A (see attached DVD).

1.02 RELATED WORK:

- A. Section 01330, SUBMITTALS
- B. Section 01331, DOCUMENTATION
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02428, CURED-IN-PLACE PIPE
- E. Section 02429, CURED-IN-PLACE SHORT LINER
- F. Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT
- G. Section 02443, SERVICE CONNECTION REHABILITATION

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workers and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO) Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, the pipe cleaning and inspection of the specified length of pipe shall be carried out in accordance with SEWER LINE CLEANING; TELEVISION INSPECTION, MAIN SEWERS; SEWER PIPE JOINT TESTING, MAIN SEWERS; AND SEWER PIPE JOINT SEALING, MAIN SEWERS (PACKER METHOD) of NASSCO Recommended Specifications for Sewer Collection System Rehabilitation. Sewer flow control shall comply with Section 01575, HANDLING OF EXISTING FLOWS.
 - B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- 1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
- A. Prior to beginning work, submit six (6) sets of the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Description of system proposed for handling existing flows during the various procedures to be carried out.
 - 3. Description of the system and equipment proposed for cleaning the pipe.
 - 4. Description of the equipment and system proposed for inspecting the pipe after cleaning.
 - B. Refer to Section 01331, DOCUMENTATION for required documentation to be submitted.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.01 PIPE CLEANING:

- A. Chemical root treatment, where required, shall be applied under Section 02437, SEWER LINE AND MANHOLE CHEMICAL ROOT TREATMENT before the cleaning operation is carried out. Sufficient time shall be allowed between the two operations as described in SEWER LINE CHEMICAL ROOT TREATMENT (FOAMING METHOD) of the NASSCO Standard Specifications.
- B. The Contractor may elect to use either high velocity jet, or mechanically powered equipment, as described in the NASSCO Standard Specifications. Selection of equipment shall be based upon field conditions such as access to manholes, quantity of debris, size of sewer, depth of flow, etc.
- C. All sludge, dirt, sand, rocks, grease, and other solid or semisolid material shall be removed from the sewer and shall be disposed of in accordance with all applicable regulations and in a method acceptable to the Owner. No material shall be deposited downstream from the cleaning operation. Pipe cleaning shall be performed in advance of pipe television inspection.

- D. The Contractor shall be responsible for the legal disposal of all debris removed from the sewers during the cleaning operation including any costs incurred. The Contractor shall not expect the Owner to provide a dump site.
- E. Acceptance by the Engineer of the cleaning results will be based on the results of television inspection. If the results are unsatisfactory, the Contractor shall repeat the cleaning until accepted by the Engineer at no additional cost to the Owner.

3.02 PIPE INSPECTION:

- A. Pipe shall be visually inspected by means of closed-circuit television. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture, with minimal reflective glare, for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 400 line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer.
 - 1. Refer to Section 01331, DOCUMENTATION, in regard to DVD's/external hard drives to be given to the Owner upon completion of project and before the project is accepted by the Owner.
- B. The camera shall have a remote controlled, pan and tilt type lens and lighting system capable of turning perpendicular to the direction of flow and rotating 360 degrees while inside the pipe. The camera shall be able to view a minimum service connection length of 4 feet in order to determine whether the connection is active or inactive.
- C. Electronic video equipment shall be capable of displaying and recording during the entire inspection, as a minimum, the following data for each sewer reach videotaped:
 - 1. Project identification
 - 2. Date recorded
 - 3. Sewer reach identification (street location, MH to MH)
 - 4. Footage counter
- D. The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper identification of the sewer's condition. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation the television camera will not pass through the entire sewer section, the Contractor shall re-set his equipment in a manner so that the inspection can be performed from the opposite manhole.
- E. Flow control shall be in accordance with Section 01575, HANDLING OF EXISTING FLOWS.
- F. Standing water within a sagging pipe shall be removed so that the pipe can be adequately television inspected. A minimum of 80% of the pipe shall be visible before television inspection.

- F. Removal of obstruction caused by protruding taps shall be in accordance with Section 02443, SERVICE CONNECTION REHABILITATION.
- G. Television inspection shall be performed in advance of point repair of gravity sewers and pipe lining activities.

END OF SECTION

SECTION 02442

POINT REPAIR OF GRAVITY SEWERS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the point repair of gravity sewers using open cut construction methods. The Work includes furnishing all equipment, material and labor required to point repair a sewer pipe section as described herein.
- B. A point repair shall be identified as a repair made at a specified location on a sanitary sewer line. The point repairs are identified on the plans.

1.02 RELATED WORK:

- A. Section 01575, HANDLING EXISTING FLOWS
- B. Section 01740, CLEANING UP
- C. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- D. Section 02089, DUCTILE IRON GRAVITY PIPE AND FITTINGS FOR SEWERS AND UNDERDRAINS
- E. Section 02252, SUPPORT OF EXCAVATION
- F. Section 02300, EARTHWORK
- G. Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS
- H. Section 02631, PRECAST MANHOLES
- I. Section 02745, PAVING
- J. Section 02920, LOAMING and SEEDING

1.03 QUALITY ASSURANCE:

The Work described herein shall be performed by a company with not less than two years of experience in providing the required services, employing experienced supervisory personnel.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO) Specifications Guidelines for Sewer Collection System Maintenance & Rehabilitation.

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Prior to beginning the Work, submit six (6) sets of the following:

1. Qualifications of the firm/personnel who will perform the Work.
2. Description of system proposed for handling existing flows, if necessary.
3. Description of the system, equipment and material proposed, including the source and name of manufacturer.
4. Specifications and Data Sheets of all materials to be used, including a list of applicable ASTM standards.
5. Material and structural details of the point repair method proposed, including typical cross-sections and strength calculations.

PART 2 - PRODUCTS

2.01 GENERAL:

All workmanship and materials used for making point repairs shall be of the highest quality. The materials shall be the products of a manufacturer actively engaged in research, development and manufacturing of said materials.

2.02 REPAIR PIPE:

The repair pipe shall be POLYVINYL CHLORIDE GRAVITY PIPE as specified in Section 02085. The inside diameter of the replacement pipe size shall be the same as the existing pipe.

2.03 JOINT MATERIALS:

When connecting together joints of plain-end spigot pipe, suitable adaptors shall be used for joining dissimilar pipe materials. The adapters shall be Fernco Couplings, or approved equal. All materials shall pass the strength and chemical requirements of current ASTM requirements. Adapters and methods of connecting pipes shall be approved by the Engineer. The Contractor shall submit to the Engineer descriptive literature and materials on the adaptors and connection method he proposes to use.

2.04 BUILDING CONNECTIONS:

Any building connection replaced during a point repair shall conform to pipe manufacturer's recommendations and specifications and applicable ASTM specifications, for furnishing and installing the building connection. The connection materials shall be similar to the connecting sewer pipe.

2.05 SEALING OPEN JOINTS:

Any open joint to be sealed during a point repair shall be yarned, wiped and encased with concrete. The encasement shall be centered on the joint, have a minimum thickness of six (6) inches of concrete, and have a minimum length equal to the pipe diameter, but not less than twelve (12) inches. Any alternative method for sealing open joints shall be submitted to the Engineer for approval.

PART 3 - EXECUTION

3.01 SAFETY:

The Contractor shall perform all work in strict accordance with all applicable OSHA and State standards. Particular attention is drawn to those safety requirements regarding confined space entry and trench excavation safety.

3.02 POINT REPAIR METHOD:

The method by which the point repair shall be made shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. Excavate a trench deep enough to uncover the gravity sewer line and wide enough and long enough to work in, in accordance with the latest OSHA requirements.
2. Remove any existing fences, base material, storm sewers, water mains, and other items that interfere with the repair made at each specific point, and replace the fences, base material, storm sewers, water mains, and other removed items in the same or better condition than found, as determined by the Engineer.
3. Replace and reshape the bottom of the trench so that the grade of the pipes replaced will match that required for the existing sewer line and underdrain. Any material replaced in the bottom of the trench shall be tamped so as to prevent sags in the sewer line due to settlement of trench material. If the material in the bottom of the trench is not stable, the Contractor shall stabilize the trench bottom by placing suitable materials at the direction of the Engineer.
4. Repair and replace existing underdrain pipe with the same size ductile iron pipe, as described in Specifications Section 02089, DUCTILE IRON FOR SEWERS. Replacement of underdrain pipe shall be considered incidental to the work and shall not be measured separately for payment.
5. Repair and replace the section of damaged sewer. The damaged section of pipe shall be removed and a replacement section of PVC pipe shall be spliced in its place, using Fernco couplings at each end of the splice.

6. Repair and replace any service wye or tee encountered within the required point repair to the property line. All service lines broken by the Contractor shall be replaced by the Contractor at his expense.
7. Seal open joints exposed within the pipe excavation, where the barrel of the pipe is still satisfactory but the joints are not. Any roots in open joints shall be removed before sealing. Determination as to whether or not roots exist shall be made by the Engineer. The materials to use when sealing open joints are listed in subsection 2.05.
8. Connect all newly laid sewer pipe to existing pipe, and main sewer lines to services, so that no possible source of infiltration/inflow (a leak in the line) may be created. When applicable, the main sewer line shall be cut so that a smooth plain-end spigot exists at both ends of the trench and connected, as specified in subsection 2.03. The materials used to make the tie-ins shall be properly sized as specified in section 2.01. Any sewer pipe broken by the Contractor shall be replaced at the Contractors expense. All such occurrences shall be pointed out to the Engineer.
9. Backfill the excavation, and replace the trench pavement as specified in Section 02745, so that the finished elevation will match the natural ground elevation and no ponding will occur after the backfilled material has settled.
10. Clean up the area as specified in Section 01740 CLEANING UP.

3.03 REPLACE 6" SEWER SERVICE:

The method by which the sewer service is replaced shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. The Contractor shall replace the 6-inch sewer service in accordance with Specifications Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.
2. The Contractor shall replace the mainline section of sewer pipe with 8 inch PVC pipe on each end of the installed PVC wye, a minimum repair length of four (4) feet, and shall connect to the existing mainline pipe using Fernco couplings, as described in Section 3.02 above.

3.04 INSTALL SEWER MANHOLE COMPLETE:

The method by which the sewer manhole is installed and the sewer service is replaced shall include all supervision, labor, equipment and materials necessary to perform and successfully complete the following items of work:

1. The Contractor shall replace the existing manhole at B066-52 on Garden Road with a new sewer manhole in accordance with Section 02631 PRECAST MANHOLES.
2. Existing 6-inch sewer service, connected directly into the lamphole, shall be replaced to the property line and connected to the mainline at a minimum of 3 feet from the outside of the new manhole wall, in accordance with Section 02530 BUILDING CONNECTIONS AND DROP CONNECTIONS.

3.05 ABANDONMENT:

- A. If a decision is made by the Engineer in the field that a point repair will not satisfactorily correct the problem, or if the Contractor excavates at the required location and does not find the source of the problem, the Engineer shall verify the condition, declare the point repair to be abandoned and the excavation shall be backfilled.
- B. At such time as the point repair has been declared abandoned, the Engineer shall determine how to proceed or whether to reclassify the sewer line for further investigation.

3.06 FIELD JUDGEMENTS:

At any time during a point repair, the Engineer shall make field judgements which shall govern the point repair process until such time that the specifications will again prevail. Field judgements shall include the following situations and any other questionable situation that may arise:

- 1. Determination of the length of sewer pipe to repair.
- 2. Determination of method of payment for additional work outside the original point repair area.
- 3. Determination of dewatering requirements.
- 4. Determination of abandonment.
- 5. By-pass pumping of sewage and underdrain flow.
- 6. Determination of the amount of asphalt, concrete driveway, curb or sidewalk, or any other surface feature to be replaced.

3.07 BY-PASS PUMPING:

On all point repairs, the normal flow of sewage and underdrain flow shall be re-routed by by-pass pumping so as not to interrupt the flow of sewage to the treatment plant. By-pass pumping shall be as specified in Section 01575 HANDLING OF EXISTING FLOWS.

3.08 RESTORATION:

- A. The Contractor shall replace all streets, roadways, sidewalks, and driveways which may be removed, disturbed, or damaged in connection with his operation under this Contract. The Contractor shall reconstruct same to the original lines and grades and in such a manner as to leave all such surfaces in fully as good or better condition than that which existed prior to his operations. The re-use of materials removed in making excavations will be permitted in the manner described, provided said materials are in good condition and are acceptable to the Engineer.
- B. In easements and other unpaved areas, the Contractor shall return the area as close as is practicable to its original condition to the satisfaction of the Engineer, at no additional cost to the Owner.

3.09 INSPECTION

A. TELEVISION INSPECTION:

1. On completion of each section of sewer, including building connections installed to the property line, the Contractor shall TV inspect the section in accordance with Section 02440, SEWER CLEANING AND INSPECTION, at no additional cost to the owner.
2. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the sewer.
3. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
4. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

END OF SECTION

SECTION 02443

SERVICE CONNECTION REHABILITATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers the rehabilitation of service connections, including cutting of protruding services, television inspection and testing of services, and grouting of services as called for herein and on the drawings. The work includes furnishing all equipment, material and labor required to perform the services described herein.

1.02 RELATED WORK:

- A. Section 01330, SUBMITTALS
- B. Section 01331, DOCUMENTATION
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02428, CURED-IN-PLACE PIPE
- E. Section 02429, CURED-IN-PLACE SHORT LINER

1.03 QUALITY ASSURANCE:

- A. The work described herein shall be performed by a company with not less than five (5) years of experience in providing the required services, employing experienced workmen and experienced supervisory personnel. Supervisory personnel shall have not less than three (3) years of experience in providing the required services and shall be present at the jobsite during all work related to the required services.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

The National Association of Sewer Service Companies (NASSCO)

Recommended Specifications for Sewer Collection System Rehabilitation (Current Edition).

1.05 SYSTEM DESCRIPTION:

- A. Unless otherwise indicated herein, service connection rehabilitation shall be carried out in accordance with LATERAL SEWER SEALING, FROM MAIN SEWER of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.

- B. The Contractor may propose alternative processes and/or products for review and approval by the Engineer.
- C. The location of the service connection rehabilitations are indicated on the drawings.

1.06 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Prior to beginning the work, submit six (6) sets of the following:
 - 1. Qualifications of the firm/personnel who will perform the work.
 - 2. Descriptions of system proposed for handling existing flows, if necessary, during the procedures to be carried out.
 - 3. Description of the system, equipment and material proposed for the service connection rehabilitations.
 - 4. Manufacturer's warranty.
 - 5. Submit MSDS Data Sheets for proposed chemicals to be used.
- B. Refer to Section 01331, DOCUMENTATION, for documentation required to be submitted.

1.07 WARRANTY:

- A. The service connection rehabilitations shall be warranted against infiltration and faulty workmanship and materials for one year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 CHEMICAL GROUT:

- A. The Contractor shall use chemical grout which is environmentally safe for the sealing of sewers. The chemical sealing materials shall be used in accordance with CHEMICAL SEALING (GROUTING) MATERIALS of the NASSCO Standard Specifications. All other products used for sealing, patching and cleaning of sewers shall also be environmentally safe.
- B. The chemical grout material shall be EPA registered and labeled for use in sewer lines and acceptable to the state agencies having jurisdiction over its use.

PART 3 - EXECUTION

3.01 PIPE CLEANING AND INSPECTION:

- A. Pipe cleaning and inspection shall be carried out in accordance with Section 02440, SEWER CLEANING AND INSPECTION.

3.02 FLOW CONTROL:

- A. Flow control, if required, shall be in accordance with Section 01575, HANDLING EXISTING FLOWS.

3.03 CUTTING OF PROTRUDING SERVICE CONNECTIONS:

- A. The Contractor shall cut protruding service connections where called for on the drawings. The protruding services shall be cut flush with the wall of the sewer, using either a lateral cutter or grinder.
- B. After the protruding services are cut, the service connections shall be grouted in accordance with paragraph 3.05 of this Section. No additional payment shall be made for grouting service connections.

3.04 TELEVISION INSPECTION AND TESTING OF SERVICE CONNECTIONS:

- A. The Contractor shall television inspect and test service connections where called for on the drawings. Television inspection of services shall utilize a pan and tilt camera which shall inspect a minimum of 4 feet of the service connection from the main sewer.
- B. Pressure Testing: Air testing is accomplished by isolating the area to be tested with the packer and applying positive pressure into the isolated VOID area. VOID area shall include a minimum 3 feet of service connection pipe.
- C. Pressure testing shall be carried out in accordance with LATERAL SEWER SEALING, FROM MAIN SEWER 3 of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- D. The television inspection and testing equipment shall be capable of inspecting and testing 4-inch, 5-inch and 6-inch diameter service connections.
- E. If the service fails the pressure test, the service shall be grouted in accordance with paragraph 3.05 of this Section. If the service passes the pressure test, grouting is not required.

3.05 GROUTING OF SERVICE CONNECTIONS:

- A. The Contractor shall grout service connections where indicated on the drawings or when a service fails the pressure test, as described in paragraph 3.04 of this Section. The Contractor shall grout all service connections reinstated as described in Section 02428, CURED-IN-PLACE PIPE or Section 02429, CURED-IN-PLACE SHORT LINER, regardless of the results of the pressure test. Grouting of service connections shall be carried out in accordance with LATERAL SEWER SEALING, FROM MAIN SEWER of the NASSCO Recommended Specifications for Sewer Collection System Rehabilitation.
- B. The grouting equipment shall be capable of grouting 4-inch, 5-inch and 6-inch diameter service connections.
- C. The chemical sealing materials shall be as described in chemical sealing (grouting) materials of the NASSCO Standard Specifications.

- D. If a service connection becomes clogged with grout, the Contractor shall clear the grout from the lateral. This work shall be done at no additional cost to the Owner.

3.06 FIELD TESTING/INSPECTION:

- A. Prior to the expiration of the warranty period, an initial test sample of approximately 25% of the original service connection rehabilitation work will be selected and approved by the Engineer. The test sample will consist of manhole sections from throughout the project area that are representative of the sealing work originally performed. The Contractor shall television inspect and test all previously grouted service connections within the initial test sample as specified in paragraph 3.04 of this Section. Any service connections failing the retest shall be regouted as specified in paragraph 3.05 of this Section.
- B. If the failure rate in the initial test sample is less than 5%, the work will be considered satisfactory and no further testing will be required.
- C. If the failure rate in the initial test sample equals or exceeds 5%, an additional and equivalent test sample will be selected and approved by the Engineer. Additional test samples will be tested and resealed as necessary until the failure rate of less than 5% is met. No previously tested service connections can be included in a subsequent warranty test sample.
- D. Television inspecting, testing, and regrouting of service connections shall be performed prior to the expiration of the warranty period, during periods of high groundwater and at a time to be approved by the Engineer.
- E. All inspecting, retesting, and regrouting within the warranty period shall be provided at no additional cost to the Owner.

END OF SECTION

SECTION 02518

TRACER TAPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers the furnishing, handling and installation of tracer tape, as called for on the drawings.

1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.
- B. Tape samples shall also be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Tracer tape shall be by Lineguard, Inc., Wheaton, IL; Empire Level, Waukesha, WI; Pro-Line Safety Products Co., W. Chicago, IL; or approved equal.

2.02 TRACER TAPE:

- A. Tracer tape shall be at least 3-inches wide.
- B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick and must be locatable at a depth of 18 inches with ordinary pipe locaters.
- C. Tracer tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.
- D. The tape shall bear the wording: "BURIED DRAIN LINE BELOW" (with "DRAIN" replaced by "WATER", "SEWER", "ELECTRICAL", "GAS", "TELEPHONE", or "CHEMICAL" as appropriate), continuously repeated every 30 inches to identify the pipe.

- E. Tape colors shall be as follows, as recommended by the American Public Works

Association (APWA):

Electric	Red
Gas & Oil	Yellow
Communications	Orange
Water	Blue
Sewer & Drain	Green
Chemical	Red (not APWA)

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Tracer tape shall be installed directly above the pipe or conduit it is to identify, approximately 12 inches below the proposed ground surface.
- B. The Contractor shall follow the manufacturer's recommendations for installation of the tape, as approved by the Engineer.

END OF SECTION

SECTION 02530

BUILDING CONNECTIONS AND DROP CONNECTIONS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers furnishing of all materials and labor to construct building sewer connections and drop connections as indicated on the Drawings, and as herein specified.
- B. Final location of building connections shall be determined in the field by the Engineer.

1.02 RELATED WORK:

- A. Section 01331, DOCUMENTATION
- B. Section 01535, TEMPORARY BYPASS PUMPING SYSTEM
- C. Section 01575, HANDLING EXISTING FLOWS
- D. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- F. Section 02300, EARTHWORK
- H. Section 02518, TRACER TAPE
- I. Section 02531, SEWER CHIMNEYS
- K. Section 02631, PRECAST MANHOLES
- L. Section 03302, FIELD CONCRETE

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of shop drawings and manufacturers literature of the materials of this section shall be submitted to the Engineer for review.
- B. Shop drawings of any special connections, including the proposed adapters for service connections, shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Pipe and fittings for drop connections and for gravity building connections shall be as specified under Section 02085 POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS. Adaptors shall be as recommended by the pipe manufacturer.
- B. Concrete for encasement shall be as specified in Section 03302 FIELD CONCRETE.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. EXISTING ACTIVE BUILDING CONNECTION REPLACEMENT:

1. The Contractor shall affix a written notice to the door of each home that has sewer service to be disconnected and reinstated 48-hours prior to disconnection of the service and again the day of disconnection. A completion notice shall also be distributed following reconnection of the sewer service.
2. The written notice must include an approximation of the time that the service will be bypass pumped and the notice be approved by the Engineer prior to its distribution. The printing and distribution of notices to the homeowners by the Contractor shall be considered incidental to construction.
3. Flow from the existing sewer services shall be bypass pumped as specified in Section 01575 HANDLING EXISTING FLOWS and in Section 01535 TEMPORARY BYPASS PUMPING SYSTEM.
4. The existing service pipeline shall be removed at or near the property line and replaced as described below.
5. Building connections shall be installed using the same construction and pipe joining techniques as specified in Section 02085 POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS.
6. New connections shall be carried to the existing building connection at the property line. Final connection between the new and existing piping shall be made with an appropriate adapter fitting to insure a watertight seal.
7. The Contractor shall replace the mainline section of sewer pipe with 8 inch PVC pipe on each end of the installed PVC wye, a minimum repair length of four (4) feet, and shall connect to the existing mainline pipe using Fernco couplings as described in Section 02442, POINT REPAIR OF GRAVITY SEWERS.
8. Where building connection changes line and grade, a cleanout shall be installed as directed by the Engineer.
9. Prior to connecting to the new sewer service, the existing sewer service shall be televised (starting at the property line upstream to the building) using a color “push” camera. The

condition of the service shall be documented in the same manner as a mainline sewer and in accordance with section 02440, SEWER CLEANING AND INSPECTION. Documentation shall be in accordance with section 01331, DOCUMENTATION. Each video shall be labeled with the street address of inspected sewer service. No additional payment shall be made for television inspection.

B. DROP CONNECTIONS:

1. When the invert of a pipe entering a manhole is 24 inches or more above the invert of the lowest pipe leaving the manhole, it shall be connected to the manhole with an outside drop section. The manhole shall be constructed in the normal manner except that a straight-through clean-out pipe shall be connected through the manhole wall.
2. The drop pipe shall be the same diameter, material, and class as the sewer pipe entering the manhole, unless otherwise noted in the drawings. After installation of the outside drop section and pipe connections into the manhole, the entire vertical, outside assembly shall be encased in concrete, as shown on the drawings, using concrete with strength of at least 3000 psi.

END OF SECTION.

SECTION 02531

SEWER CHIMNEYS

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers furnishing all equipment, materials and labor to provide and install sewer chimneys as shown on the Drawings and described herein. Final locations of the chimneys shall be as determined in the field by the Engineer.

1.02 RELATED WORK:

- A. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS
- B. Section 02089, DUCTILE IRON PIPE AND FITTINGS FOR GRAVITY SEWER AND UNDERDRAINS
- C. Section 02300, EARTHWORK
- D. Section 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS

1.03 SYSTEM DESCRIPTION:

The sewer chimney shall be designed and installed such that it provides a direct positive connection from the mainline pipe to the building connection, will withstand the required pressure tests after backfilling, and will not be adversely affected by local settlement after completion and acceptance by the Owner. Ductile iron tees shall be used in the mainline at each location of the chimney as indicated in the detailed drawings.

1.04 REFERENCES:

- A. The following standards form a part of these specifications, as referenced:

American Society for Testing & Materials (ASTM)

ASTM	D1557	Test for Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Rammer and 18-inch Drop.
ASTM	D3034	Specification for Type PSM Poly (Vinyl-Chloride) (PVC) Sewer Pipe and Fittings.

American Water Works Association (AWWA)

AWWA	C900	Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12 inch, for Water Distribution.
AWWA	C110	Ductile -Iron and Gray-Iron Fittings

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of shop drawings and manufacturers literature of the materials of this section shall be submitted to the Engineer for review.

PART 2 - PRODUCT

2.01 CHIMNEYS:

- A. Chimneys shall consist of a minimum 6-inch PVC pipe extending vertically from the mainline pipe to the local building connection elevation. The pipe and fittings shall be SDR 35 or heavier. A wye shall be placed at the top of the riser and a PVC plug cleanout shall be provided at the top of the fitting for future cleaning of the chimney.
- B. The riser pipe shall be protected during installation with a 18 inch diameter sonotube or ABS ribbed pipe section or equivalent encasement, as shown on the Drawings or approved by the Engineer, to prevent damage to the pipe or movement of the pipe during the backfilling operation. The encasement shall be supported independently of the mainline pipe at the base.
- C. If the Contractor decides to replace the PVC pipe with DI Pipe, it will be permitted at no additional cost to the Owner.
- D. Building connection piping from the chimney to the property line shall be in accordance with Section, 02530, BUILDING CONNECTIONS AND DROP CONNECTIONS.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Unless otherwise indicated, at locations designated by the Engineer to receive sewer chimneys, crushed stone shall be placed and compacted in maximum 6-inch lifts from the bottom of the trench to the top of the mainline pipe.
- B. The Contractor shall install the sewer chimney piping and then backfill carefully to avoid dislocating or damaging the chimney piping.
- C. The completed chimney shall be tested with and subject to the same test requirements as the sewer main to which it is attached.

END OF SECTION

SECTION 02538

SANITARY SEWER MANHOLE BENCH AND INVERT

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers manholes benches and inverts complete, including, but not limited to, bases, mortar, benches and inverts.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01330, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS

1.03 SYSTEM DESCRIPTION:

Invert channel and bench shall be formed of brick and mortar upon the base.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM C923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
ASTM C1244	Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
- B. Tests reports as required shall be submitted to the Engineer.

PART 2 –BENCH AND INVERT MATERIALS

2.01 The bench and invert shall be formed of brick and mortar, as specified in this specification section.

2.02 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand.
- D. Cement shall be Type II portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. BENCH AND INVERT BRICK WORK:

- 1. All debris and deteriorated brick, block, and mortar shall be removed from the bottom of the manhole before the bench and invert are rebuilt.
- 2. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- 3. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
- 4. The brick bench and invert shall conform accurately to the size of the manhole and adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid

out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

3.02 CLEANING:

All manholes shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

SECTION 02631

PRECAST MANHOLES

PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers all precast manholes complete, including, but not limited to, bases, walls, cones, mortar, inverts, frames and covers.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02745, PAVING
- C. Section 03302, FIELD CONCRETE

1.03 SYSTEM DESCRIPTION:

- A. Precast sections shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as ordered by the Engineer.
- B. All manholes shall have concrete bases. Concrete bases shall be precast unless otherwise specified. Invert channels shall be formed of brick and mortar upon the base.
- C. Riser and cone sections shall be precast concrete.

1.04 REFERENCES:

- A. The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM A48	Gray Iron Castings
ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM C478	Precast Reinforced Concrete Manhole Sections
ASTM C923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes

ASTM C1244

Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M198

Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

Occupational Safety and Health Administration

OSHA 29 CFR 1910.27

Fall Prevention Protection

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
- B. Tests reports as required shall be submitted to the Engineer.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE SECTIONS:

- A. All precast concrete sections shall conform to ASTM C478 with the following exceptions and additional requirements:
 - 1. The wall thickness of precast sections shall be as designated on the drawings, meeting the following minimum requirements:

<u>Section Diameter (Inches)</u>	<u>Minimum Wall Thickness (Inches)</u>
48	5
60	6
72	7
84	8

- 2. Type II cement shall be used except as otherwise approved.
- 3. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
- 4. Minimum compressive strength of concrete shall be 4000 psi at 28 days.
- 5. No more than two lift holes may be cast or drilled in each section.
- 6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section.

7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
8. Circumferential steel reinforcement in walls and bases shall be a minimum of 0.12 sq. in./lin. ft. for 4-foot diameter sections and 0.15 sq. in./lin. ft. for 5- and 6-foot diameter sections. Reinforcing shall extend into tongue and groove.

- B. Conical reducing sections shall have a wall thickness not less than 5-inches at the bottom and wall thickness of 8-inches at the top. Conical sections shall taper from a minimum of 48-inches diameter to 24 or 30-inches diameter at the top, as shown on the drawings.
- C. Except where insufficient depth of cover dictates the use of a shorter base, bases shall be a minimum of 4 feet in height.
- D. Slab top sections and flat riser sections (Grade Rings) shall conform to the contract drawings, with particular attention focused upon the reinforcing steel and be designed to meet or exceed an H-20 Loading requirement.
- E. The tops of the bases shall be suitably shaped by means of accurate ring forms to receive the riser sections.
- F. Precast sections shall be manufactured to contain wall openings of the minimum size to receive the ends of the pipes, such openings being accurately set to conform with line and grade of the sewer or drain. Subsequent cutting or tampering in the field, for the purpose of creating new openings or altering existing openings, will not be permitted except as directed by the Engineer.
- G. The exterior surfaces of all precast manhole bases, walls, and cones shall be given a minimum of one shop coat of bituminous dampproofing.
- H. The Engineer reserves the right to reject any unsatisfactory precast section and the rejected unit shall be tagged and removed from the job site immediately.
- I. The Engineer may also require the testing of concrete sections as outlined under Physical Requirements in ASTM C478 with the Contractor bearing all testing costs.

2.02 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand.

- D. Cement shall be Type II portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.03 FRAMES, GRATES, COVERS AND STEPS:

- A. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.
- B. All castings shall be thoroughly cleaned and may be subject to a careful hammer inspection at the Engineer's discretion.
- C. Castings shall be ASTM A48 Class 30B or better.
- D. The surface of the manhole covers shall have a diamond pattern with the cast words "WATER," "DRAIN" or "SEWER," whichever is appropriate.
- E. Manhole frames with 26-inch covers for 24-inch openings shall be 475 pounds minimum by E.L. LeBaron Foundry Co. or approved equal.
- F. Manhole steps shall conform to ASTM C478 requirements and shall be fabricated of either extruded aluminum or steel reinforced plastic. Steps shall be uniformly spaced at a maximum of 12-inches unless otherwise shown on the drawings.

2.04 SEWER MANHOLE ACCESSORIES:

- A. Gasket materials shall be top grade (100% solids, vulcanized) butyl rubber and shall meet or exceed AASHTO M-198.
- B. Couplings at the manhole-pipe interface shall be made with a rubber seal system (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection.
- C. Stubs installed as specified and indicated on the drawings shall be short pieces of the same class pipe as that entering the manhole and shall have either stoppers or end caps as shown on the drawings. Stoppers or end caps shall be especially designed for that application.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. PRECAST SECTIONS:

1. Precast bases shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300 EARTHWORK, at least 6-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth.
2. Precast reinforced concrete sections shall be set vertical and with sections in true alignment.
3. Butyl rubber joint sealant shall be installed between each concrete section. Catch basin sections do not require joint sealant if so indicated on the drawings.
4. All holes in sections used for handling the sections shall be thoroughly plugged with mortar. Mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

B. BRICK WORK:

1. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
2. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
3. The brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

C. CASTINGS:

1. Cast iron frames, grates and covers shall be as specified. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as indicated on the drawings. Frames shall be adjusted to meet the street surface.
2. Cast iron manhole frames and covers not located in paved areas shall be set 6-inches above finished grade, at a height as directed by the Engineer, or as indicated on the drawings. The top of the cone shall be built up with a minimum of 1 course and a maximum of 5 courses of brick and mortar used as headers for adjustment to final grade.
3. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.
4. Covers shall be left in place in the frames, for safety reasons, except while work is being performed.

D. ACCESSORIES:

1. Accessories shall be installed in accordance with manufacturer's instructions.

2. Stubs shall be set accurately to the dimensions indicated on the drawings. Stubs shall be sealed with suitable watertight plugs.

3.02 LEAKAGE TESTS:

- A. Leakage tests shall be made by the Contractor and observed by the Engineer on each manhole. The test shall be by vacuum or by water exfiltration as described below:

B. VACUUM TEST:

1. The vacuum test shall be conducted in accordance with ASTM C1244. Test results will be judged by the length of time it takes for the applied vacuum to drop from 10 inches of mercury to 9 inches. If the time is less than that listed in Table 1 of ASTM C1244, the manhole will have failed the test. Test times from Table 1 are excerpted below.

TABLE 1

Minimum Test Times for Various Manhole Diameters

<u>Depth (Feet)</u>	<u>Diameter (Inches)</u>		
	48	60	72
	<u>Times (Seconds)</u>		
0-12	30	39	49
12-16	40	52	67
16-20	50	65	81
20-24	59	78	97
26-30	74	98	121

2. If the manhole fails the initial test, the Contractor shall locate the leaks and make proper repairs. Leaks may be filled with a wet slurry of accepted quick setting material. If the manhole should again fail the vacuum test, additional repairs shall be made, and the manhole water tested as specified below.

C. WATER EXFILTRATION TEST:

1. After the manhole has been assembled in place, all lifting holes shall be filled and pointed with an approved non-shrinking mortar. All pipes and other openings into the manhole shall be suitably plugged and the plugs braced to prevent blow out. The test shall be made prior to placing the shelf and invert. If the groundwater table has been allowed to rise above the bottom of the manhole, it shall be lowered for the duration of the test.
2. The manhole shall be filled with water to the top of the cone section. If the excavation has not been backfilled and observation indicates no visible leakage, that is, no water visibly moving down the surface of the manhole, the manhole may be considered to be satisfactorily water-tight. If the test, as described above, is unsatisfactory as determined by the Engineer or if the manhole excavation has been backfilled, the test shall be continued. A period of time may be permitted if the Contractor so wishes, to allow for absorption by the manhole. At the

end of this period, the manhole shall be refilled to the top of the cone, if necessary, and a measuring time of at least 8 hours begun. At the end of the test period, the manhole shall be refilled to the top of the cone, measuring the volume of water added. This amount shall be extrapolated to a 24-hour loss rate and the leakage determined on the basis of depth. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed 3 gallons per vertical foot per day, repairs by approved methods may be made as directed by the Engineer to bring the leakage within the allowable rate of one gallon per foot per day. Leakage due to a defective section or joint or exceeding the 3 gallon per vertical foot per day, shall be cause for rejection of the manhole. It shall be the Contractor's responsibility to uncover the rejected manhole as necessary and to disassemble, reconstruct or replace it as directed by the Engineer. The manhole shall then be retested and, if satisfactory, interior joints shall be filled and pointed.

3. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorption, etc. It shall be assumed that all loss of water during the test is a result of leaks through joints or through the concrete. Furthermore, the Contractor shall take any steps necessary to assure the Engineer that the water table is below the bottom of the manhole throughout the test.
4. If the groundwater table is above the highest joint in the manhole, and there is no leakage into the manhole, as determined by the Engineer, such a test can serve to evaluate water-tightness of the manhole. However, if the Engineer is not satisfied with the results, the Contractor shall lower the water table and carry out the test as described hereinbefore.

3.03 CLEANING:

All new manholes shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

SECTION 02745

PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials and equipment and shall replace the pavements as indicated on the drawings and as herein specified.

1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01562, DUST CONTROL
- C. Section 02058, CONTROLLED DENSITY FILL (CDF)
- D. Section 02300, EARTHWORK
- E. Section 02631, PRECAST MANHOLES

1.03 SYSTEM DESCRIPTION:

A. GENERAL

The types of pavement systems to be utilized on this project are as follows:

PERMANENT TRENCH PAVEMENT

B. PERMANENT TRENCH PAVEMENT

Areas shall be paved with temporary trench binder course pavement to match existing road surface, minimum of 2 inches thick, as soon as practicable after installation of individual pipeline segments. Temporary pavement shall be maintained a minimum of 90 days prior to installation of permanent trench base course pavement, permanent binder course pavement, and permanent trench top course pavement. See applicable table below for pavement thickness schedule. This may require that the temporary pavement be maintained until the following year, at which time the permanent pavement shall be installed. Permanent trench binder course and trench top course pavement shall be installed only with the approval of the Engineer.

PAVEMENT THICKNESS SCHEDULE

PAVEMENT A (Requires Controlled Density Fill)

STREET	SHEET	BASE COURSE (INCHES)	BINDER COURSE (INCHES)	TOP COURSE (INCHES)
CENTRE STREET	C-1	3	2	2

PAVEMENT B

STREET	SHEET	BINDER COURSE (INCHES)	TOP COURSE (INCHES)
BOYD STREET	C-12	2	2
CHESTNUT STREET	C-4	2	2
CLAREMONT STREET	C-12	2	2
CONVERSE STREET	C-12	2	2
GARDEN ROAD	C-12	2	2
LENOX STREET	C-2	2	2
MOUNT VERNON STREET	C-5	2	2

1.04 REFERENCES

The following standards form a part of these specifications and indicate the minimum standards required:

American Society for Testing and Materials (ASTM)

ASTM D1557 Test for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 Pound Rammer and 18-Inch Drop

Commonwealth of Massachusetts Highway Department
Standard Specification for Highway and Bridges (MHD)

MHD 405 Gravel Base Course

MHD 420 Class I Bituminous Concrete Base Course, Type I-1

MHD 460 Class I Bituminous Concrete Pavement

MHD 476 Cement Concrete Pavement

MHD 860 Reflectorized Pavement Markings

Federal Specifications

AASHTO Standard Specifications for Materials and Methods of Sampling and Testing

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of complete job mix formula shall be submitted to the Engineer at least two weeks before any of the work of this section is to begin.

PART 2 - PRODUCTS

2.01 CONTROLLED DENSITY FILL:

Controlled Density Fill (CDF) shall satisfy the requirements listed in Section 02058, CONTROLLED DENSITY FILL[DME5].

2.02 GRAVEL SUBBASE:

- A. Gravel subbase shall consist of inert material that is hard durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials.
- B. Gradation requirements for gravel subbase shall be as specified in Section 02300, EARTHWORK for Gravel Borrow.

2.03 BITUMINOUS CONCRETE PAVEMENT:

- A. Bituminous concrete pavements shall consist of Class I Bituminous Concrete, Type I-1.
- B. Bituminous concrete mixtures shall be within the composition limits of base courses, binder courses, and top courses in accordance with MHD M3.11.03, with constituents that conform to Table A, below.

TABLE A

PERCENT BY WEIGHT PASSING SIEVE DESIGNATION

Standard Sieves (in.)	Base Course	Binder Course	Top Course	Surface Treat.	Low Permeability Pavement	
					Dense Binder Course	Dense Top Course
2 in	100					
1 in	55-80	100			100	
¾ in		80-100			80-100	
5/8 in			100			
½ in	40-65	55-75	95-100		65-80	100
3/8 in			80-100	100		80-100
No.4	20-45	28-50	50-76	80-100	48-65	55-80
No.8	15-33	20-38	37-54	64-85	37-51	48-63
No.16			26-40	46-68		36-49
No.30	8-17	8-22	17-29	26-50	17-30	24-38
No.50	4-12	5-15	10-21	13-31	10-22	14-27
No.100*			5-16	7-17	6-18	6-18
No.200	0-4	0-5	2-7	3-8	0-6	4-8
Bitumen	4-5	4.5-5.5	5.5-7.0	7-8	5-6	7-8

* Percentages shown for aggregate sizes are stated as proportional percentages of total aggregate for the mix.

Unless authorized by the Engineer, no Job-Mix Formula will be approved which specifies:

Less than 4% passing No. 200 for Top Course.
Less than 6% bitumen for Top Course.

- C. The joint sealant shall be a hot poured rubberized emulsified asphalt sealant meeting the requirements of FS SS-S-1401.
- D. The tack coat shall be an asphalt emulsion, RS-1 if required, conforming to MHD Section M3.03.0.

2.04 SEAL COAT:

- A. Seal coats shall be within the composition limits for protective seal coat emulsion in accordance with MHD M3.03.3.
- B. Silica sand when blended with seal coat emulsion shall be No. 30 silica sand.

2.05 PAVEMENT MARKINGS:

- A. Pavement markings shall conform to the requirements of MHD 860.
- B. The mixture of the marking material shall be within the composition limits for reflectorized pavement markings as described in the MHD Specifications as follows:

1. Thermoplastic reflectorized pavement markings - M7.01.03/04.

2. Fast drying traffic paint - M7.01.10/11.

- C. Application of the glass beads to be used as reflector material on the striping shall conform to Sections 860.62 and M7.03.07 of the MHD Specifications.

2.06 PAINT FOR PARKING LOTS

- A. Paint for parking lot lines shall conform to Federal Specification TT-P-115-E Type 1. Paint shall be 11-3 PPG Industries, Pittsburgh, PA or approved equal.

PART 3 - EXECUTION

3.01 GENERAL:

Paving courses required for the project shall be as shown on the drawings and as specified herein. Pavement thicknesses specified are measured in compacted inches. If a pavement course thickness exceeds 2-1/2 compacted inches, the course shall be installed in multiple lifts with each lift not exceeding 2-1/2 compacted inches in thickness.

3.02 CONTROLLED DENSITY FILL:

Controlled Density Fill shall be used for backfilling in locations requiring PAVEMENT A, as described on the plans and in Section 02058, CONTROLLED DENSITY FILL (CDF).

3.03 GRAVEL SUBBASE:

- A. The gravel subbase to be placed under pavement shall consist of 12-inches of gravel evenly spread and thoroughly compacted.
- B. The gravel shall be spread in layers not more than 4-inches thick, compacted measure. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.

3.04 TEMPORARY BITUMINOUS PAVEMENT:

- A. Where specified and directed by the Engineer and after placement of the gravel subbase, the Contractor shall place temporary bituminous pavement above the trench, between the edges of the existing pavement. It shall consist of Class I Bituminous Concrete Pavement, Type I-1, minimum 2-inches thick, in accordance with MHD 460.
- B. The temporary pavement shall be repaired as necessary to maintain the surface of the pavement until replaced by permanent pavement. When so directed by the Engineer, the Contractor shall remove the temporary pavement and install or regrade the subbase for installation of permanent pavement.

3.05 PERMANENT BITUMINOUS PAVEMENT:

- A. The bituminous paving mixture, equipment, methods of mixing and placing, and the precautions to be observed as to weather, condition of base, etc., shall be in accordance with MHD 460.

B. BASE COURSE AND BINDER COURSE PAVEMENT:

1. Immediately prior to installing the base and/or binder course, the trimmed edges shall be made stable and unyielding, free of loose or broken pieces and all edges shall be thoroughly broomed clean. Contact surfaces of trench sides, curbs, manholes, catch basins, or other appurtenant structures in the pavement shall be painted thoroughly with a uniform coating of asphalt emulsion (tack coat), just before any mixture is placed against them.
2. The binder course shall be repaired as necessary to maintain the surface of the pavement until placement of the permanent overlay. If required, the Contractor shall place a leveling course before placing the permanent overlay.

C. TOP COURSE PAVEMENT (PERMANENT OVERLAY):

1. Top course [DME6] shall be placed over the trench or full width as shown on the drawings or as specified.
2. Prior to placement of the top course, the entire surface over which the top course is to be placed shall be broom cleaned and tack coated.
3. Top course pavement placed over trenches may be feathered to meet existing paved surfaces, if approved by the Engineer.
4. Prior to placing full width top course pavements, keyways shall be cut in all intersecting streets.

3.06 PAVEMENT PLACEMENT:

- A. Unless otherwise permitted by the Engineer for particular conditions, only machine methods of placing the pavement shall be used. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to line, grade, width and crown. The mixtures shall be placed and compacted only at such times as to permit proper inspection and checking by the Engineer.
- B. After the paving mixtures have been properly spread, initial and intermediate compaction shall be obtained by the use of steel wheel rollers having a weight of not less than 240 pounds per inch width of tread.
- C. Final rolling of the top course pavement shall be performed by a steel wheel roller weighing not less than 285 pounds per inch width of tread at a mix temperature and time sufficient to allow for final smoothing of the surface and thorough compaction.
- D. Immediately after placement of top course pavement, all joints between the existing and new top course pavements shall be sealed with hot poured rubberized asphalt joint sealant.
- E. Where there is no backing for the edges of the curb-to-curb pavement, the Contractor shall provide a gravel transition. The gravel transition shall be installed immediately after the pavement is placed, shall be feathered and extend a minimum of 18 inches, and shall be compacted using the same equipment as for pavement compaction. The gravel shall be uniformly graded material with a maximum size of 3/8 to 1/2 inch.

- F. When directed by the Engineer, the Contractor shall furnish and install additional paving to provide satisfactory transition for driveways and walkways impacted by a new curb-to-curb pavement installation. The transition installation will be considered incidental to the curb-to-curb pavement installation.

3.07 ADDITIONAL PAVING:

- A. If the Engineer determines that the existing bituminous concrete pavement on local streets is thicker than the permanent pavement specified herein, the Contractor may be required to install additional Type I-1 bituminous concrete to obtain the depth of the existing pavement.
- B. If for the installation of full width paving, the Engineer determines that the existing road surface requires additional leveling pavement, then the Contractor shall install additional Type I-1 bituminous concrete to bring the section to proper line and cross section. Additional paving required to restore the proper line and cross section of binder course installed by the Contractor which has become rough and uneven shall be furnished and installed at the expense of the Contractor.

3.08 PARKING LOTS AND DRIVEWAYS:

- A. Pavement shall consist of a 2-inch binder course and a 1-1/2-inch top course on a 12-inch gravel sub-base. All thicknesses are compacted thicknesses.
- B. Adjacent concrete work, slate work, sidewalks, structures, etc., shall be protected from stain and damage during the entire operation. Damaged or stained areas shall be replaced or repaired to equal their original condition.
- C. All joints between binder and top course shall be staggered a minimum of 6-inches.
- D. After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened sufficiently to prevent distortion and loss of fines, and in no case in less than 6 hours.
- E. Smoothness of all areas of the finished surface shall not vary more than 1/4-inch when tested with a 16 foot straight-edge, applied both parallel to and at right angles to the centerline of the paved area. At building entrances, curbs, and other locations where an essentially flush transition is required, pavement elevation tolerance shall not exceed plus or minus 1/8-inch. Irregularities exceeding these amounts, or which retain water on the surface, shall be corrected by removing the defective work and replacing or repairing it to the satisfaction of the Engineer.
- F. The surface area to be seal coated shall be swept and air cleaned. The first coat shall be applied with eight (8) pounds of #30 silica sand blended with each gallon of emulsion applied at a rate of 0.15 gallons per square yard. The second coat shall be a straight sealer applied at the rate of 0.1 gallons per square yard.
- G. The Contractor shall prepare the pavement surface for painting lines according to the recommendations of the paint manufacturer. Applied markings shall have clean-cut edges, true and smooth alignment and uniform film thickness of 15 mils, +/- 1.0. The Contractor shall be

responsible for removing, to the satisfaction of the Engineer, tracing marks, and spilled paint applied in an unauthorized area.

3.09 RAISING AND ADJUSTING CASTINGS:

- A. In areas of permanent top course paving, existing municipally-owned catch basin and manhole castings and valve boxes shall be raised to the proper grade where directed by the Engineer.
- B. Castings owned by private utilities shall be raised by their own forces. The Contractor shall be responsible for coordinating this work.
- C. The method of adjusting these castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8-inches from casting. Excavate and if required rebuild up to 12-inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement or bituminous concrete collar, as directed, to approximately 1½-inches below the raised casting grade. Masonry work shall conform to Section 02631, PRECAST MANHOLES.
- D. In some areas, raising of castings may not be required. Where directed by the Engineer, castings not to be raised shall have at least 12-inches of bituminous concrete pavement chipped and removed around the casting. New bituminous concrete pavement shall be placed and compacted around such castings to approximately 1-1/2-inches below the top of the casting. The overlay course shall then be sloped down to the level of the casting.
- E. The method of raising valve boxes shall be as follows: Cut around valve box a minimum of 8-inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement or bituminous concrete collar, as directed, to approximately 1-1/2-inches below the top of the valve box.
- F. Castings which need to be raised or adjusted to complete permanent curb to curb paving shall be done immediately prior to paving.

3.10 PAVEMENT MARKINGS:

- A. The Contractor shall replace all pavement markings removed or covered-over in carrying out the work, and as directed by the Engineer, no sooner than 48 hours after completion of permanent pavement. The markings shall be 4-inches wide, white or yellow, single or double lines as required.
- B. When directed by the Engineer, the Contractor shall provide temporary markings at no additional cost to the Owner.

3.11 PAVEMENT REPAIR:

- A. If required in the contract or if permanent pavement becomes rough or uneven, permanent pavement patches and trenches shall be repaired and brought to grade utilizing "infrared" paving methods following completion of the construction.

- B. The Contractor performing the work shall use care to avoid overheating the pavement being repaired.
- C. Pavement repair shall extend a minimum of 6-inches beyond all edges of the pavement patch to assure adequate bonding at the pavement joints.

END OF SECTION

SECTION 02770

SEALING OF UNDERDRAIN ACCESS PORTS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers seal cavern at the base of the manhole and redirect access port to the manhole bench, redirect access ports or “boats” from the manhole invert to the manhole bench, seal access ports located on the manhole bench, and seal cross connections located on the manhole bench.
- B. The Contractor shall furnish all labor, materials, equipment and incidentals required to complete the work as directed by the Engineer; as shown on the Drawings and as specified herein.

1.02 RELATED WORK:

- A. Section 01014, SCOPE AND SEQUENCE OF WORK
- B. Section 01300, SUBMITTALS
- C. Section 01331, DOCUMENTATION
- D. Section 01575, HANDLING EXISTING FLOWS
- E. Section 02085, POLYVINYL CHLORIDE GRAVITY PIPE AND FITTINGS

1.03 SYSTEM DESCRIPTION

- A. The sealing of caverns[DME7] and redirection of access ports in manholes shall conform to the details indicated on the drawings or as directed by the Engineer.
- B. Access ports that protrude into the sanitary sewer invert shall be removed and rebuilt on the adjacent manhole bench. Access ports shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as directed by the Engineer.
- C. The sealing of access ports shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as directed by the Engineer.
- D. The sealing of cross connections in manholes shall conform to the details indicated on the drawings or as directed by the Engineer.

1.04 REFERENCES:

The following standards form a part of this specification as referenced:

American Society for Testing and Materials (ASTM)

ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes
ASTM D1784	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
ASTM F 477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
ASTM D3034	Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
ASTM D3212	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

A. Prior to beginning the work, submit six (6) sets of the following:

1. Qualifications of the firm/personnel who will perform the work.
2. Manufacturer literature of the materials of this section.
3. Tests reports, as required.
4. Manufacturer's warranty.
5. Description of the system proposed for bypass pumping during the procedures to be carried out.

B. Refer to Section 01331, DOCUMENTATION, for required documentation to be submitted

1.06 WARRANTY:

Redirect access ports, seal access ports, seal cross connections, and seal caverns shall be warranted against infiltration and faulty workmanship and materials for one (1) year from the date the project is accepted by the Owner.

PART 2 - PRODUCTS

2.01 ACCESS PORT CAP MATERIALS:

A standard sized threaded PVC cap shall be used to plug the access port.

2.02 ACCESS PORT REDIRECTION MATERIALS:

- A. Oakum soaked in Avanti AV-202 grout compound or approved equal shall be used to achieve a watertight seal between the PVC pipe and the existing access port structure.
- B. Access port redirection piping shall be made of 6" schedule 40 PVC. All pipe joints shall be watertight.
- C. A standard sized threaded PVC cap shall be used to plug the redirected access port.

2.03 ACCESS PORT SEALING MATERIALS:

- A. Access port sealing fittings and piping size shall closely approximate existing access port size and shall not be smaller than 6" schedule [DME8]40 PVC. All pipe joints shall be watertight.
- B. Oakum soaked in Avanti AV[DME9]-202 grout compound or approved equal shall be used to achieve a water tight seal between the PVC pipe and the existing access port structure.
- C. A standard sized threaded PVC cap shall be used to plug the redirected access port.

2.04 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand.
- D. Cement shall be Type II portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. Sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.

2.05 CONCRETE:

- A. Cement shall be domestic portland cement conforming to ASTM C150, Type II.

- B. Fine aggregate shall be washed natural sand conforming to ASTM C33
- C. Coarse aggregate shall be well graded crushed stone conforming to ASTM C33, size No. 67 unless otherwise directed.
- D. Water shall be potable, clean, and free from deleterious amounts of acids, alkalis, oils, or organic matter.
- E. No admixtures shall be used unless approved by the Engineer in writing.

PART 3 - EXECUTION

3.01 SEAL CAVERN AND REDIRECT ACCESS PORT:

- A. The Contractor shall be aware of all potential water at the repair site including sanitary flow, underdrain flow, and groundwater. Bypass pumping of sanitary flow, underdrain flow, and groundwater shall be considered incidental to the work.
- B. The manhole invert and bench shall be demolished to remove the existing access port from the sewer invert.
- C. Redirection of existing access ports shall consist of removing the existing access port to the underdrain as shown on the Drawings. A 6" PVC pipe, or a PVC pipe closely approximating the diameter of the existing underdrain pipe, as directed by the Engineer, shall be placed in the existing underdrain channel and secured in place with activated oakum, or approved equal, to create a watertight seal between the sewer and the underdrain. The new PVC pipe shall be joined to the existing underdrain pipe to maintain underdrain flow through the manhole. The access port shall be installed using a factory tee connection and shall be extended to the manhole bench. The new pipe shall be bedded and backfilled with concrete as specified herein and shown on the drawings.
- D. New access ports shall be six (6) inches in diameter. Each access port shall be fitted with a standard-sized watertight threaded PVC cap. Access port shall protrude no less than twelve (12) inches and no more than twenty-four (24) inches above the bench of the manhole.
- E. Following access port redirection, the manhole bench and invert shall be reconstructed in accordance with Section 02538, SANITARY SEWER MANHOLE BENCH AND INVERT. Contractor shall insure that concrete is placed beneath the bench and invert such that there are no void spaces. Contractor shall inspect each manhole structure and verify components required to outfit each structure[DME10].
- F. Voids (cavern) in lower portion of manholes shall be sealed with brick to create a watertight seal between the underdrain and sanitary sewer. Bricks shall be staggered and end-to-end with two (2) courses.
- G. All material shall be removed from the cavern prior to starting the repair.
- H. A six (6) inch schedule 40 PVC access pipe shall be laid in the brickwork in a water tight fashion to provide hydraulic access to the underdrain side of the chamber, if required, and as directed by the

Engineer. Each access pipe shall be sloped toward the sanitary sewer invert and be fitted with a standard sized water tight threaded PVC cap. The brick wall shall be constructed as shown in the drawings.

- I. The six (6) inch pipe shall be installed as close to the top of the cavern as possible, as indicated in the drawings and as directed by the Engineer.
- J. Any damage to the existing manhole, pipe, or underdrain shall be repaired by the Contractor at his own expense, as directed by the Engineer.

3.02 REDIRECT ACCESS PORT[DME11]:

- A. The Contractor shall be aware of all potential water at the repair site including sanitary flow, underdrain flow, and groundwater. Bypass pumping of sanitary flow, underdrain flow, and groundwater shall be considered incidental to the work.
- B. The manhole invert and bench shall be demolished to remove the existing access port from the sewer invert.
- C. Redirection of existing access ports shall consist of removing the existing access port to the underdrain as shown on the Drawings. A 6" PVC pipe, or a PVC pipe closely approximating the diameter of the existing underdrain pipe, shall be secured in place with activated oakum or approved equal so to create a watertight seal between the sewer and the underdrain. The new PVC pipe shall be connected to the existing underdrain pipe to maintain underdrain flow through the manhole. The access port shall be installed using a tee connection and extended to the manhole bench. The new pipe shall be bedded and backfilled with concrete as specified herein.
- D. New access ports shall be six (6) inches in diameter. Each access port shall be fitted with a standard-sized watertight threaded PVC cap. Access port shall protrude no less than twelve (12) inches and no more than twenty-four (24) inches above the bench of the manhole.
- E. Following access port redirection, the manhole bench and invert shall be reconstructed in accordance with Section 02538, SANITARY SEWER MANHOLE BENCH AND INVERT. The reconstructed brick invert shall be a uniform depth and shall closely approximate the width of the sewer pipe. Contractor shall insure that concrete is placed beneath the bench and invert to insure there are no void spaces and the underdrain pipe is watertight. Pipe alignment shall be maintained by use of external adapters, inflatable plugs, or other manufacturer approved methods. Contractor shall inspect each manhole structure and verify components required to outfit each structure.
- F. Any damage to the existing manhole, pipe, or underdrain shall be repaired by the Contractor at his own expense, as directed by the Engineer.

3.03 SEAL ACCESS PORT:

- A. Existing access ports located on the manhole bench shall be sealed so that the manhole and underlying drain is not damaged.

- B. Installation of all sealing material shall be in accordance with manufacturer's instructions and as specified herein.
- C. Any damage to the existing manhole, pipe, fittings, or underdrain shall be repaired by the Contractor at his own expense as directed by the Engineer.
- D. The contractor shall be aware of all potential water at the repair site including sanitary flow, underdrain flow, and groundwater.
- E. New access ports shall be six (6) inches to eight (8) inches in diameter and shall most closely approximate the diameter of the existing underdrain. Each access port shall be fitted with a standard-sized water tight threaded PVC cap. Access port shall protrude no less than twelve (12) inches and no more than twenty-four (24") inches above the bench of the manhole.
- F. The new pipe shall be placed inside the existing access port and a water tight seal created between the pipe and the existing access port structure using oakum soaked in Avanti AV[DME12]-202 grouting compound or approved equal. The oakum shall be wedged between the PVC pipe and the existing access port structure to create a water tight seal. The seal shall be of a thickness capable of firmly securing the pipe within the access port and shall be approved by the Engineer. The remaining space above the seal shall be filled with hydraulic cement and made flush with the manhole bench.
- G. No material shall be allowed to enter the underdrain during the sealing process.

3.04 SEAL CROSS CONNECTION:

- A. Existing cross connection located on the manhole bench shall be sealed so that the manhole and the underlying drain are not damaged.
- B. The Contractor shall remove all material from the drain.
- C. The drain shall be bricked over to create a water tight seal with the manhole bench. The Contractor may choose to install a PVC pipe, closely approximating the size of the drain, over the drain channel to serve as a form for the brickwork[DME13]. The bench shall be constructed in accordance with Section 02538, SANITARY SEWER MANHOLE BENCH AND INVERT.

3.05 BRICK WORK:

- A. Mortar shall be mixed only in such quantity as may be required for immediate use and shall be used before the initial set has taken place. Mortar shall not be retained for more than 1-1/2 hours and shall be constantly worked over with a hoe or shovel until used. Anti-freeze mixtures will not be allowed in the mortar. No masonry shall be laid when the outside temperature is below 40 degrees F unless provisions are made to protect the mortar, bricks and finished work from frost by heating and enclosing the work with tarpaulins or other suitable material. The Engineer's decision as to the adequacy of protection against freezing shall be final.
- B. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

- C. Bricks shall be laid as headers in a full bed and joints of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
- D. Brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.
- E. Channels and shelves shall be constructed of brick and concrete as shown on the Drawings. The brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Brick surfaces exposed to sewage flow shall be constructed with a nominal 2 inch by 8 inch face exposed (i.e. bricks on edge).

3.06 FIELD TESTING/INSPECTION:

- A. The Engineer may require an inspection with a television “push” camera at the conclusion of each ACCESS PORT SEAL to ensure that the underdrain was not damaged during the repair. Contractor shall provide documentation of this inspection that is consistent with Section 01331, DOCUMENTATION. The Contractor shall repair any damage caused by his work at his own expense as directed by the Engineer.
- B. Prior to expiration of the warranty period, during periods of high groundwater, and at a time to be approved by the Engineer, the Contractor shall inspect 100% of the access point repairs performed during this project. The Contractor shall repair any defects found until there are no visible leaks. Defects will be determined by the Engineer.
- C. All inspection and rework shall be provided at no additional cost to the Owner.

END OF SECTION

SECTION 02771

CURBING

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers furnishing and installation of granite curb, bituminous concrete curb and precast parking curb, where required, as shown on the Drawings and herein specified.
- B. This section also covers replacement of curbing removed during construction.

1.02 RELATED WORK:

- A. Section 02300 EARTHWORK
- B. Section 02745, PAVING
- C. Section 02775, SIDEWALK CONSTRUCTION AND REPLACEMENT

1.03 REFERENCES:

The following standards form a part of these specifications, as referenced:

Massachusetts Highway Department

MHD: Standard Specifications for Highways and Bridges

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six sets of shop drawings, showing dimensions of typical curb sections, shall be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.01 GRANITE CURBING:

- A. Granite curbing shall be Type VAI conforming to Subsection M9.04.1 of the latest edition of the MHD Standard Specifications for Highways and Bridges.
- B. Special shapes and corners shall be supplied as required.

2.02 GRANITE EDGING:

- A. Granite edging shall be Type SB conforming to Subsection M9.04.2 of the latest edition of the MHD Standard Specifications for Highways and Bridges.
- B. Special shapes and corners shall be supplied as required.

2.03 BITUMINOUS CONCRETE CURB

Bituminous concrete curb shall be Type 2 conforming to Subsection M3.12.0 of the latest edition of the MHD Standard Specifications for Highways and Bridges.

2.04 PRECAST PARKING LOT CURB:

- A. Precast parking lot curb shall be formed with concrete rated at 3500 psi at 28 days.
- B. The manufacturer shall maintain at the manufacturing site a record of material used and their sources, and a copy of concrete mix designs.
- C. Precast parking lot curb shall be the Standard Precast Bumper Curb as manufactured by Durastone Co., Lincoln, RI, or approved equal.

PART 3 - EXECUTION

3.01 GRANITE CURBING:

- A. Removal and resetting and/or removal and replacing of granite curbing shall be in accordance with Section 580 of the latest edition of the MHD Standard Specifications for Highways and Bridges. The curbing shall have a 7-inch reveal unless otherwise directed by the Engineer.
- B. Except as modified herein or on the drawings, installation of curbing shall conform to Section 500 of the MHD Standard Specifications for Highways and Bridges.
- C. Excavation shall be made to the bottom of the 6-inch gravel base below the curbing, the trench being sufficiently wide to permit thorough tamping. The base shall be compacted to a firm, even surface and shall be approved by the Engineer.
- D. The curbing shall be set on edge and settled into place with a heavy wooden hand-rammer, to the line and grade required, straight and true for the full depth. The joints of the stone curbing shall be pointed with mortar for the full depth of the curbing. At approximately 50-foot intervals, a 1/2-inch joint shall not be filled with mortar but left free for expansion. The ends of the stone curbing at driveways and intersections shall be cut at a bevel or rounded as directed by the Engineer.
- E. The trench for the stone curbing shall be backfilled with approved material; the first layer to be 4 inches in depth, thoroughly rammed; the other layers to be more than 6 inches in depth and thoroughly rammed until the trench is filled.
- F. Where indicated on the plans, or as directed, drainage openings shall be made through the curbing at the elevations and of the size required.

3.02 GRANITE EDGING:

- A. Except as modified herein and on the drawings, installation of granite edging shall conform to Section 500 of MHD Standard Specifications for Highways and Bridges.
- B. The cement concrete base shall be placed on a well-tamped sub-base acceptable to the Engineer, and shall be constructed of 3000 psi concrete, minimum, as shown on the drawings.
- C. The edging shall be set to the proper lines and grades on the concrete base and on a well-tamped sloping gravel surface.

3.03 BITUMINOUS CONCRETE CURB:

- A. Replacement of bituminous concrete curbs shall be in accordance with Section 500 of the latest edition of the Standard Specification for Highways and Bridges of the Department of Public Works of the Commonwealth of Massachusetts and all amendments thereto. The curbing shall have a 6-inch reveal unless otherwise directed by the Engineer.
- B. Unless modified herein, installation shall conform to Section 501.64 of the MHD Standard Specifications for Highways and Bridges.
- C. When indicated on the plans, or as directed, drainage openings shall be made through the curb at the elevations and of the size required.

3.04 PRECAST PARKING LOT CURBING:

- A. Precast parking lot curbing shall be furnished and installed as indicated on the drawings.
- B. Any units, which are cracked, chipped, spalled, or otherwise damaged, shall be removed and replaced with units meeting the specified requirements.

END OF SECTION

SECTION 02775

SIDEWALK CONSTRUCTION AND REPLACEMENT

PART 1 - GENERAL

1.01 WORK INCLUDED:

The Contractor shall furnish all labor, materials, equipment and incidentals required to restore gravel sidewalks and/or construct new or replacement bituminous or cement concrete sidewalks where directed or where existing sidewalks are disturbed by the Contractor, as shown on the drawings and described herein. The Contractor shall also furnish all materials and install wheelchair ramps where shown on the drawings or as directed by the Engineer.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK
- B. Section 02771, CURBING

1.03 REFERENCES

The following standards form a part of these specifications, as referenced:

Commonwealth of Massachusetts Highway Department (MHD)
Standard Specifications for Highways and Bridges

1.04 SUBMITTALS

The Contractor shall submit six (6) sets of shop drawings and/or materials specifications for each component of the work to be performed under this section of the Specifications.

1.05 SYSTEM DESCRIPTION:

A. GRAVEL SIDEWALKS:

Gravel sidewalks shall be restored to a condition at least equal to that existing immediately before the work was started.

B. BITUMINOUS AND CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

1. Except as otherwise indicated, bituminous and cement concrete sidewalks and wheelchair ramps shall be constructed in accordance with the requirements of Section 701, Sidewalks, Wheelchair Ramps and Driveways, of the latest edition of the Standard Specifications for Highways and Bridges of the Massachusetts Highway Department (MHD), and all amendments thereto.
2. Wheel chair ramps shall be installed in new sidewalks at intersections in accordance with 521 CMR. When curbs or sidewalks are constructed or reconstructed on one side of the street,

curb cuts shall also be installed on the opposite sides of the street, where there is a pedestrian path of travel. Curb cuts shall be located within the crosswalk and/or the pedestrian path of travel.

- C. Water boxes, manhole frames, and all other castings shall be carefully set to the proposed finished grade.
- D. Sidewalks shall not be less than 48 inches in width, excluding curbing. An unobstructed path of travel shall be provided which is at least 36 inches clear, excluding curbing.

PART 2 - PRODUCTS

2.01 BITUMINOUS CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. Bituminous concrete sidewalks and wheelchair ramps shall consist of Class I Bituminous Concrete.
- B. Bituminous concrete shall conform to the requirements of MHD M3.11, Table A, Dense Mix.

2.02 CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. Cement concrete sidewalks shall be constructed with air entrained Cement Concrete with a minimum compressive strength of 4000 psi at 28 days.
- B. Cement concrete shall conform to the requirements of MHD M4.02.

PART 3 - EXECUTION:

3.01 BITUMINOUS CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. The subgrade for the bituminous concrete sidewalks and wheelchair ramps shall be shaped parallel to the proposed surface of the sidewalks and shall be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard in order for a gravel foundation to be placed upon it.
- B. The bituminous concrete sidewalk shall be a minimum of 2½ compacted inches thick, laid in two equal courses. The sidewalk pitch shall be 3/16 inch per foot of width or shall match the existing sidewalk.

3.02 CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

- A. Concrete for sidewalks and wheelchair ramps shall be a minimum of 4 inches thick. At driveways, the sidewalks shall be 6 inches thick.
- B. The subgrade for the walk or driveway shall be shaped to a true surface conforming to the proposed slope of the walk, thoroughly rolled at optimum moisture content and tamped with a power roller weighing not less than one ton and not more than 5 tons. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.
- C. After the subgrade has been prepared as hereinbefore specified, a subbase of gravel borrow at optimum moisture content shall be placed, thoroughly rolled by a power roller, and tamped. The gravel borrow shall be a minimum of 8 inches in thickness.

- D. The forms for sidewalks shall be smooth, free from warp, strong enough to resist springing out of shape, and deep enough to conform to the thickness of the proposed walk. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked, thoroughly braced, and set to the established lines with their upper edge conforming to the grade of the finished walk. The finished walk shall have sufficient pitch from the outside to the edge of the walk to provide for surface drainage. This pitch shall be 1/4 of an inch per foot unless otherwise directed by the Engineer. Before the concrete is placed, the subbase for sidewalks shall be thoroughly dampened until it is moist throughout but without puddles of water.
- E. Concrete shall be conveyed from the place of mixing to the place of deposit in such a manner that no mortar will be lost, and the composition of the mix shall be uniform, showing neither excess nor lack of mortar in any one place. The consistency shall be such that water will float to the surface under heavy tamping. The concrete shall be placed as close to its final position as practicable and thoroughly consolidated, with precautions taken not to overwork it while it is still plastic. The concrete shall be thoroughly spaded along the forms or screeds to eliminate voids and honeycombs at the edges. Retempering of concrete will not be permitted.
- F. Concrete shall be placed in alternate slabs not exceeding 30 feet in length. Slabs shall be separated by transverse preformed expansion joint filler 1/2 inch thick. The surface of all concrete sidewalks shall be uniformly scored into block units of not more than 40 square feet. The depth of the scoring shall be at least one quarter of the thickness of the sidewalk.
- G. When concrete sidewalks are constructed adjacent to curbing, building foundations, retaining walls, light pole bases or fixed structures, 1/2 inch thick premolded joint filler shall be used between the newly constructed sidewalk and the structure.
- H. Finishing of the concrete surface shall be done by experienced and competent cement finishers as soon as is practicable. Finishing shall be delayed until all bleed water and water sheen has left the surface and the concrete has begun to stiffen. The concrete surface shall be finished as directed with a steel trowel or wood float to give a smooth, uniform and attractive surface finish and uniformly scored into block units or areas of not more than 36 square feet. Following this, the Contractor shall draw a nylon push broom lightly over the surface to produce a non-slip surface. Application of neat cement to the surface to hasten hardening is prohibited.
- I. The Contractor shall protect the newly placed concrete surface against vandalism and marking or defacing and must stand ready to replace any blocks which, in the opinion of the Engineer, are excessively marked or defaced, at no additional cost to the Owner. When completed the walks shall be kept moist and protected from traffic and weather for at least 3 days.
- J. Adequate protection shall be provided where temperatures of 40°F or lower occur during placing of concrete and during the early curing period. The minimum temperature of fresh concrete after placing and for the first 3 days shall be maintained above 55°F. In addition to the above requirements, an additional 3 days of protection from freezing shall be maintained.

END OF SECTION

SECTION 02920

LOAMING AND SEEDING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section covers all labor, materials, and equipment necessary to do all loaming, seeding and related work as indicated on the drawings and as herein specified. All lawns disturbed by the Contractor's operations shall be repaired as herein specified.

1.02 RELATED WORK:

NOT APPLICABLE

1.03 QUALITY ASSURANCE:

- A. For a particular source of loam, the Engineer may require the Contractor to send approximately 10 pounds of loam to an approved testing laboratory and have the following tests conducted:

1. Organic concentration
2. pH
3. Nitrogen concentration
4. Phosphorous concentration
5. Potash concentration

- B. These tests shall be at the Contractor's expense. Test results, with soil conditioning and fertilizing recommendations, shall be forwarded to the Engineer.

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of information detailing the seed mixes, fertilizers, mulch material, slope protection material (if required) and origin of loam shall be submitted to the Engineer for review.
- B. Three sets of test results shall be submitted to the Engineer for review.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. LOAM:

1. Loam shall be a natural, fertile, friable soil, typical of productive soils in the vicinity, obtained from naturally well-drained areas, neither excessively acid nor alkaline, and containing no substances harmful to grass growth. Loam shall not be delivered to the site in frozen or muddy condition and shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter.
2. The loam shall contain not less than 4 percent nor more than 20 percent organic matter as determined by the loss of weight by ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F.

B. LIME:

Lime shall be standard commercial ground limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide), and 50 percent of the material must pass through a No. 100 mesh sieve with 98 percent passing a No. 2 mesh sieve.

C. FERTILIZER:

Fertilizer shall be commercial fertilizer, 10-10-10 fertilizer mixture containing at least 40 percent of organic nitrogen. It shall be delivered to the site in the original sealed containers, each showing the manufacturer's guaranteed analysis. Fertilizer shall be stored so that when used it will be dry and free flowing. No fertilizer shall be used which has not been marketed in accordance with State and Federal Laws, relating to fertilizers.

D. MULCH:

1. Materials to be used in mulching shall conform to the following requirements:
2. Hay Mulch - Hay Mulch shall consist of mowed and properly cured grass, clover or other acceptable plants. No salt hay shall be used.
3. Straw Mulch - Straw Mulch shall consist of stalks or stems of grain after threshing.
4. Wood Fibre Mulch - Wood Fibre Mulch shall consist of wood fibre produced from clean, whole uncooked wood, formed into resilient bundles having a high degree of internal friction and shall be dry when delivered to the project.

E. SEED:

1. Seed shall be of an approved mixture, the previous year's crop, clean, high in germinating value, a perennial variety, and low in weed seed. Seed shall be obtained from a reliable seed company and shall be accompanied by certificates relative to mixture purity and germinating value.
2. Grass seed for lawn areas shall conform to the following requirements:

	Proportion by Weight	Germination Purity	Purity Minimum
Chewing's Fescue	30%	70%	97%
Kentucky 31 Fescue	30%	90%	98%
Kentucky Blue Grass	20%	80%	85%
Domestic Rye Grass	20%	90%	98%

3. Grass seed for cross-country areas, slopes and other areas not normally mowed shall conform to the following requirements:

	Proportion by Weight	Germination Minimum	Purity Minimum
Creeping Red Fescue	50%	85%	95%
Kentucky 31	30%	85%	95%
Domestic Rye	10%	90%	98%
Red Top	5%	85%	92%
Ladino Clover	5%	85%	96%

F. TEMPORARY COVER CROP:

1. Temporary cover crop shall conform to the following requirements:

	% Weight	Germination Minimum
Winter Rye	80 min.	85%
Red Fescue (creeping)	4 min.	80%
Perennial Rye Grass	3 min.	90%
Red Clover	3 min.	90%
Other Crop Grass	0.5 max.	
Noxious Weed Seed	0.5 max.	
Inert Matter	1.0 max.	

G. SLOPE EROSION PROTECTION:

1. Erosion control blanket shall be 100% degradable plastic mesh with 100% degradable straw or straw/coconut fill. Fill shall be held together by degradable fastening. Weight shall be 0.50 lb/sq. yd. Erosion control blankets shall be applied parallel to direction of water flow. The

erosion control blankets shall be by North American Green, Evansville, IN or approved equal. For slopes 2:1 or greater, Model SC150 shall be used. For slopes less than 2:1, Model S150 shall be used.

2. Six inch wire staples shall be placed according to manufacturers recommendations to anchor the mesh material. Staples shall be designed to decompose.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION:

- A. After approval of rough grading, loam shall be placed on areas affected by the Contractor's operations. Loam shall be at least 6 inches compacted thickness.
- B. Lime shall be applied to bring the pH to 6.5 or, without a soil test, at the rate of 2-3 tons of lime per acre.
- C. Fertilizer shall be applied according to the soil test, or without a soil test, at the rate of 1000 pounds per acre.
- D. Loam shall be worked a minimum of 3 inches deep, thoroughly incorporating the lime and fertilizer into the soil. The loam shall then be raked until the surface is finely pulverized and smooth and compacted with rollers, weighing not over 100 pounds per linear foot of tread, to an even surface conforming to the prescribed lines and grades. Minimum depth shall be 6-inches after completion.

3.02 SEEDING:

- A. Seeding shall be done when weather conditions are approved as suitable, in the periods between April 1 and May 30 or August 15 to October 1, unless otherwise approved.
- B. If there is a delay in seeding, during which weeds grow or soil is washed out, the Contractor shall remove the weeds or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, the soil shall be lightly raked.
- C. Seed shall be sown at the approved rate, on a calm day by machine.
- D. One half the seed shall be sown in one direction and the other half at right angles. Seed shall be raked lightly into the soil to a depth of 1/4 inch and rolled with a roller weighing not more than 100 pounds per linear foot of tread.
- E. The surface shall be kept moist by a fine spray until the grass shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than 3 sq. ft., the Contractor shall reseed, roll, and water as necessary to obtain proper germination.
- F. The Contractor shall water, weed, cut and otherwise maintain and protect seeded areas as necessary to produce a dense, healthy growth of perennial lawn grass.
- G. If there is insufficient time in the planting season to complete the fertilizing and seeding, permanent seeding may be left until the following planting season, at the option of the Contractor or on order of the Engineer. In that event, a temporary cover crop shall be sown. This cover crop shall be cut and watered as necessary until the beginning of the following planting season, at which time it shall be

plowed or harrowed into the soil, the area shall be fertilized and the permanent seed crop shall be sown as specified.

3.03 PLACING MULCH:

- A. Hay or Straw Mulch shall be loosely spread to a uniform depth over all areas designated on the plans, at the rate of 4-1/2 tons per acre, or as otherwise directed.
- B. Hay or Straw Mulch may be applied by mechanical apparatus, if in the judgment of the Engineer the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be capable of spreading at least 80 percent of the hay or straw in lengths of 6-inches or more, otherwise it shall be spread by hand without additional compensation.
- C. Wood Fibre Mulch shall be uniformly spread over certain selected seeded areas at the minimum rate of 1,400 pounds per acre unless otherwise directed. It shall be placed by spraying from an approved spraying machine having pressure sufficient to cover the entire area in one operation.

3.04 SEEDING AND MULCHING BY SPRAY MACHINE:

- A. The application of lime, fertilizer, grass seed and mulch may be accomplished in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of lime, fertilizer, grass seed and mulch shall be equal to the specified quantities.
- B. A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of limestone, fertilizer, grass seed and mulch per 100 gallons of water.
- C. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above. If the results of the spray operation are unsatisfactory, the Contractor will be required to abandon this method and to apply the lime, fertilizer, grass seed and mulch by other methods.

3.05 INSPECTION AND ACCEPTANCE:

At the beginning of the planting season following that in which the permanent grass crop is sown, the seeded areas will be inspected. Any section not showing dense, vigorous growth at that time shall be promptly reseeded by the Contractor at his own expense. The seeded areas shall be watered, weeded, cut and otherwise maintained by the Contractor until the end of that planting season, when they will be accepted if the sections show dense, vigorous growth.

END OF SECTION

SECTION 03302

FIELD CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section covers concrete and all related items necessary to place and finish the concrete work.
- B. Concrete thrust, and anchor blocks, to be provided at all water main bends, tees, plugs and wyes and at other locations required by the Engineer shall be installed in accordance with the details shown on the drawings and as specified in this section.
- C. Concrete encasement for piping with shallow cover and for encasement of telephone, and electrical duct bank when specified shall be installed in accordance with the details shown on the drawings and as specified in this section.

1.02 RELATED WORK:

- A. Section 02300, EARTHWORK

1.03 REFERENCES:

- A. The following standards form a part of this specification:

American Concrete Institute (ACI)

ACI 304	Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
ACI 305	Recommended Practice for Hot Weather Concreting
ACI 306	Recommended Practice for Cold Weather Concreting
ACI SP-66	ACI Detailing Manual
ACI 318	Building Code Requirements for Reinforced Concrete

American Society for Testing and Materials (ASTM)

ASTM A615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C33	Concrete Aggregates
ASTM C94	Ready-Mixed Concrete
ASTM C143	Test for Slump of Portland Cement Concrete

ASTM C150 Portland Cement

ASTM C260 Air Entraining Admixtures for Concrete

ASTM C494 Chemical Admixtures for Concrete

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six copies of the statement of materials constituting the design of mixes for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the Contract.

PART 2 - PRODUCTS

2.01 CONCRETE:

- A. All concrete, reinforced or non-reinforced shall have a 28 day compressive strength of 3000 psi unless otherwise noted on the design drawings. A minimum of 5.5 sacks of cement per cubic yard and a maximum water cement ratio of 6.9 gallons per sack shall be used.
- B. Concrete shall conform to ASTM C94. The Contractor shall be responsible for the design of the concrete mixtures. Slump shall be a maximum of 4-inches and a minimum of 2-inches, determined in accordance with ASTM C143.
- C. Admixtures shall be as specified in subsection 2.04. No additional admixtures shall be used unless approved by the Engineer.
- D. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.

2.02 CEMENT:

The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to the applicable requirements of ASTM C150.

2.03 AGGREGATES

- A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
- B. Maximum size aggregate shall be 3/4-inch.

2.04 ADMIXTURES:

- A. All concrete (unless otherwise directed) shall contain an air entraining agent. Air entrained concrete shall have air content by volume of 4 to 8 percent for 3/4-inch aggregate.

- B. Air entraining agent shall be in accordance with ASTM C260 and shall be Darex AEA, as manufactured by W.R. Grace & Company; Placewel (air entraining Type), as manufactured by Johns Manville; Sika AER as manufactured by Sika Chemical Company; or an approved equal product.
- C. Water reducing agent shall be WRDA, as manufactured by W.R. Grace & Company; Placewel (non-air entraining Type), as manufactured by Johns Manville; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.
- D. Water reducing agent-retarder shall be "Daratard," as manufactured by W.R. Grace & Company; Sika Plastiment as manufactured by Sika Chemical Company; or an approved equal product.

2.05 WATER:

- A. Water for concrete shall be potable, free of deleterious amounts of oil, acid, alkali, organic matter and other deleterious substances.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or the material which would tend to reduce the bond.
- B. Earth, concrete, masonry, or other water permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed.
- C. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

3.02 THRUST AND ANCHOR BLOCKS:

- A. Minimum bearing areas for thrust blocks and dimensions of anchor blocks shall be as shown on the drawings.
- B. Concrete for thrust and anchor blocks shall be placed against undisturbed earth, and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints.

3.03 FILL CONCRETE:

- A. Fill concrete shall be placed in those locations as indicated on the design drawings. Fill concrete shall consist of materials as previously specified, with a minimum 28-day compressive strength of 3000 psi.

- B. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set.
- C. Fill concrete shall be brought to lines and grades as shown on the design drawings.

3.04 CONCRETE PLACING DURING COLD WEATHER:

- A. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when temperature is below 40°F, or is expected to fall to below 40°F, within 73 hours, and the concrete after placing shall be protected by covering, heat, or both.
- B. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

3.05 CONCRETE PLACING DURING HOT WEATHER:

- A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing, shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays, which will result in excessive mixing of the concrete after arrival on the job.
- B. During periods of excessively hot weather (90°F or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement, will not be acceptable, and will be rejected.

3.06 FIELD QUALITY CONTROL:

- A. Concrete inspection and testing shall be performed by the Engineer or by an inspection laboratory, designated by the Engineer, engaged and paid for by the Owner. Testing equipment shall be supplied by the laboratory, and the preparation of samples and all testing shall be performed by the laboratory personnel. Full assistance and cooperation, concrete for samples, and such auxiliary personnel and equipment as needed shall be provided by the Contractor.
- B. At least 4 standard compression test cylinders shall be made and tested and 1 slump test from each day's placement of concrete. A minimum of four compression test cylinders shall be made and tested for each 100 cubic yards of each type and design strength of concrete placed. One cylinder shall be tested at 7 days, and two at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. If the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days. If job experience indicates additional cylinder tests or other tests are required for proper control or determination of concrete quality, such tests shall be made.

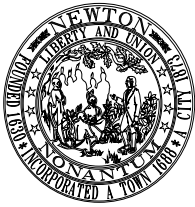
- C. The Engineer shall have the right to reject concrete represented by low strength tests. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected shall be final.

END OF SECTION

APPENDIX A
TELEVISION INSPECTION LOGS
AND
MANHOLE INSPECTION REPORTS
(SEE ATTACHED DVD)

ATTACHMENT B - TRENCH PERMIT

(4 PAGES)



City of Newton

Massachusetts 02459

Engineering Division

Phone (617) 796-1020

FAX (617) 796-1051

Permit Number _____

Date Issued _____

Expiration Date _____

Fee: \$50 x _____ = _____
Trenches Total

TRENCH PERMIT

Pursuant to G.L. c. 82A §1 and 520 CMR 7.00 et seq.(as amended)

THIS PERMIT MUST BE FULLY COMPLETED PRIOR TO CONSIDERATION

Name of Applicant			Phone		Cell	
Street Address						
City/Town	MA	ZIP				
Name of Excavator (if different from applicant)			Phone		Cell	
Street Address						
City/Town	MA	ZIP				
Name of Owner(s) of Property			Phone		Cell	
Street Address						
City/Town	MA	ZIP				
Other Contact			Permit Fee Received No () Yes ()			
Description, location and purpose of proposed trench: Please describe the exact location of the proposed trench and its purpose (include a description of what is (or is intended) to be laid in proposed trench (eg; pipes/cable lines etc..) Please use reverse side if additional space is needed.						
Insurance Certificate #:						
Name and Contact Information of Insurer:						
Policy Expiration Date:						
Dig Safe #:						
Name of Competent Person (as defined by 520 CMR 7.02):						
Massachusetts Hoisting License #						
License Grade:			Expiration Date:			

BY SIGNING THIS FORM, THE APPLICANT, OWNER, AND EXCAVATOR ALL ACKNOWLEDGE AND CERTIFY THAT THEY ARE FAMILIAR WITH, OR, BEFORE COMMENCEMENT OF THE WORK, WILL BECOME FAMILIAR WITH, ALL LAWS AND REGULATIONS APPLICABLE TO WORK PROPOSED, INCLUDING OSHA REGULATIONS, G.L. c. 82A, 520 CMR 7.00 et seq., AND ANY APPLICABLE MUNICIPAL ORDINANCES, BY-LAWS AND REGULATIONS AND THEY COVENANT AND AGREE THAT ALL WORK DONE UNDER THE PERMIT ISSUED FOR SUCH WORK WILL COMPLY THEREWITH IN ALL RESPECTS AND WITH THE CONDITIONS SET FORTH BELOW.

THE UNDERSIGNED OWNER AUTHORIZES THE APPLICANT TO APPLY FOR THE PERMIT AND THE EXCAVATOR TO UNDERTAKE SUCH WORK ON THE PROPERTY OF THE OWNER, AND ALSO, FOR THE DURATION OF CONSTRUCTION, AUTHORIZES PERSONS DULY APPOINTED BY THE MUNICIPALITY TO ENTER UPON THE PROPERTY TO MONITOR AND INSPECT THE WORK FOR CONFORMITY WITH THE CONDITIONS ATTACHED HERETO AND THE LAWS AND REGULATIONS GOVERING SUCH WORK.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO REIMBURSE THE MUNICIPALITY FOR ANY AND ALL COSTS AND EXPENSES INCURRED BY THE MUNICIPALITY IN CONNECTION WITH THIS PERMIT AND THE WORK CONDUCTED THEREUNDER, INCLUDING BUT NOT LIMITED TO ENFORCING THE REQUIREMENTS OF STATE LAW AND CONDITIONS OF THIS PERMIT, INSPECTIONS MADE TO ASSURE COMPLIANCE THEREWITH, AND MEASURES TAKEN BY THE MUNICIPALITY TO PROTECT THE PUBLIC WHERE THE APPLICANT OWNER OR EXCAVATOR HAS FAILED TO COMPLY THEREWITH INCLUDING POLICE DETAILS AND OTHER REMEDIAL MEASURES DEEMED NECESSARY BY THE MUNICIPALITY.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE MUNICIPALITY AND ALL OF ITS AGENTS AND EMPLOYEES FROM ANY AND ALL LIABILITY, CAUSES OR ACTION, COSTS, AND EXPENSES RESULTING FROM OR ARISING OUT OF ANY INJURY, DEATH, LOSS, OR DAMAGE TO ANY PERSON OR PROPERTY DURING THE WORK CONDUCTED UNDER THIS PERMIT.

APPLICANT SIGNATURE

_____ DATE _____

EXCAVATOR SIGNATURE (IF DIFFERENT)

_____ DATE _____

OWNER'S SIGNATURE (IF DIFFERENT)

_____ DATE: _____

For City/Town use -- Do not write in this section	
PERMIT APPROVED BY	\$_____ Application Fee
PERMITTING AUTHORITY	
CONDITIONS OF APPROVAL	

CONDITIONS AND REQUIREMENTS PURSUANT TO G.L.C.82A AND 520 CMR 7.00 et seq. (as amended)

By signing the application, the applicant understands and agrees to comply with the following:

- i. No trench may be excavated unless the requirements of sections 40 through 40D of chapter 82, and any accompanying regulations, have been met and this permit is invalid unless and until said requirements have been complied with by the excavator applying for the permit including, but not limited to, the establishment of a valid excavation number with the underground plant damage prevention system as said system is defined in section 76D of chapter 164 (DIG SAFE);
- ii. Trenches may pose a significant health and safety hazard. Pursuant to Section 1 of Chapter 82 of the General Laws, an excavator shall not leave any open trench unattended without first making every reasonable effort to eliminate any recognized safety hazard that may exist as a result of leaving said open trench unattended. Excavators should consult regulations promulgated by the Department of Public Safety in order to familiarize themselves with the recognized safety hazards associated with excavations and open trenches and the procedures required or recommended by said department in order to make every reasonable effort to eliminate said safety hazards which may include covering, barricading or otherwise protecting open trenches from accidental entry.
- iii. Persons engaging in any in any trenching operation shall familiarize themselves with the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CFR 1926.650 et.seq., entitled Subpart P “Excavations”.
- iv. Excavators engaging in any trenching operation who utilize hoisting or other mechanical equipment subject to chapter 146 shall only employ individuals licensed to operate said equipment by the Department of Public Safety pursuant to said chapter and this permit must be presented to said licensed operator before any excavation is commenced;
- v. By applying for, accepting and signing this permit, the applicant hereby attests to the following: (1) that they have read and understands the regulations promulgated by the Department of Public Safety with regard to construction related excavations and trench safety; (2) that he has read and understands the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CMR 1926.650 et.seq., entitled Subpart P “Excavations” as well as any other excavation requirements established by this municipality; and (3) that he is aware of and has, with regard to the proposed trench excavation on private property or proposed excavation of a city or town public way that forms the basis of the permit application, complied with the requirements of sections 40-40D of chapter 82A.
- vi. This permit shall be posted in plain view on the site of the trench.

Summary of Excavation and Trench Safety Regulation (520 CMR 14.00 et seq.)

This summary was prepared by the Massachusetts Department of Public Safety pursuant to G.L.c.82A and does not include all requirements of the 520 CMR 14.00. To view the full regulation and G.L.c.82A, go to www.mass.gov/dps. Pursuant to M.G.L. c. 82, § 1, the Department of Public Safety, jointly with the Division of Occupational Safety, drafted regulations relative to trench safety. The regulation is codified in section 14.00 of title 520 of the Code of Massachusetts Regulations. The regulation requires all excavators to obtain a permit prior to the excavation of a trench made for a construction-related purpose on public or private land or rights-of-way. All municipalities must establish a local permitting authority for the purpose of issuing permits for trenches within their municipality. Trenches on land owned or controlled by a public (state) agency requires a permit to be issued by that public agency unless otherwise designated.

In addition to the permitting requirements mandated by statute, the trench safety regulations require that all excavators, whether public or private, take specific precautions to protect the general public and prevent unauthorized access to unattended trenches. Accordingly, unattended trenches must be covered, barricaded or backfilled. Covers must be road plates at least ¾” thick or equivalent; barricades must be fences at least 6’ high with no openings greater than 4” between vertical supports; backfilling must be sufficient to eliminate the trench. Alternatively, excavators may choose to attend trenches at all times, for instance by hiring a police detail, security guard or other attendant who will be present during times when the trench will be unattended by the excavator.

The regulations further provide that local permitting authorities, the Department of Public Safety, or the Division of Occupational Safety may order an immediate shutdown of a trench in the event of a death or serious injury; the failure to obtain a permit; or the failure to implement or effectively use adequate protections for the general public. The trench shall remain shutdown until re-inspected and authorized to re-open provided, however, that excavators shall have the right to appeal an immediate shutdown. Permitting authorities are further authorized to suspend or revoke a permit following a hearing. Excavators may also be subject to administrative fines issued by the Department of Public Safety for identified violations.

For additional information please visit the Department of Public Safety’s website at www.mass.gov/dps

Summary of 1926 CFR Subpart P -OSHA Excavation Standard

This is a worker protection standard, and is designed to protect employees who are working inside a trench. This summary was prepared by the Massachusetts Division of Occupational Safety and not OSHA for informational purposes only and does not constitute an official interpretation by OSHA of their regulations, and may not include all aspects of the standard.

For further information or a full copy of the standard go to www.osha.gov.

Trench Definition per the OSHA standard:

- An excavation made below the surface of the ground, narrow in relation to its length.
- In general, the depth is greater than the width, but the width of the trench is not greater than fifteen feet.

Protective Systems to prevent soil wall collapse are always required in trenches deeper than 5', and are also required in trenches less than 5' deep when the competent person determines that a hazard exists. Protection options include:

- Shoring. Shoring must be used in accordance with the OSHA Excavation standard appendices, the equipment manufacturer's tabulated data, or designed by a registered professional engineer.
- Shielding (Trench Boxes). Trench boxes must be used in accordance with the equipment manufacturer's tabulated data, or a registered professional engineer.
- Sloping or Benching. In Type C soils (what is most typically encountered) the excavation must extend horizontally 1 ½ feet for every foot of trench depth on both sides, 1 foot for Type B soils, and ¾ foot for Type A soils.
- A registered professional engineer must design protective systems for all excavations greater than 20' in depth.
- **Ladders** must be used in trenches deeper than 4'.
- Ladders must be inside the trench with workers at all times, and located within 25' of unobstructed lateral travel for every worker in the trench.
- Ladders must extend 3' above the top of the trench so workers can safely get onto and off of the ladder.

Inspections of every trench worksite are required:

- Prior to the start of each shift, and again when there is a change in conditions such as a rainstorm.
- Inspections must be conducted by the competent person (see below).

Competent Person(s) is:

- Capable (i.e., trained and knowledgeable) in identifying existing and predictable hazards in the trench, and other working conditions which may pose a hazard to workers, and
- Authorized by management to take necessary corrective action to eliminate the hazards. Employees must be removed from hazardous areas until the hazard has been corrected.

Underground Utilities must be:

- Identified prior to opening the excavation (e.g., contact Digsafe).
- Located by safe and acceptable means while excavating.
- Protected, supported, or removed once exposed.

Spoils must be kept back a minimum of 2' from the edge of the trench.

Surface Encumbrances creating a hazard must be removed or supported to safeguard employees. Keep heavy equipment and heavy material as far back from the edge of the trench as possible.

Stability of Adjacent Structures:

- Where the stability of adjacent structures is endangered by creation of the trench, they must be underpinned, braced, or otherwise supported.
- Sidewalks, pavements, etc. shall not be undermined unless a support system or other method of protection is provided.

Protection from water accumulation hazards:

- It is not allowable for employees to work in trenches with accumulated water. If water control such as pumping is used to prevent water accumulation, this must be monitored by the competent person.
- If the trench interrupts natural drainage of surface water, ditches, dikes or other means must be used to prevent this water from entering the excavation.

Additional Requirements:

- For mobile equipment operated near the edge of the trench, a warning system such as barricades or stop logs must be used.
- Employees are not permitted to work underneath loads. Operators may not remain in vehicles being loaded unless vehicles are equipped with adequate protection as per 1926.601(b)(6).
- Employees must wear high-visibility clothing in traffic work zones.
- Air monitoring must be conducted in trenches deeper than 4' if the potential for a hazardous atmosphere exists. If a hazardous atmosphere is found to exist (e.g., O₂ <19.5% or >23.5%, 20% LEL, specific chemical hazard), adequate protections shall be taken such as ventilation of the space.
- Walkways are required where employees must cross over the trench. Walkways with guardrails must be provided for crossing over trenches > 6' deep.
- Employees must be protected from loose rock or soil through protections such as scaling or protective barricades.